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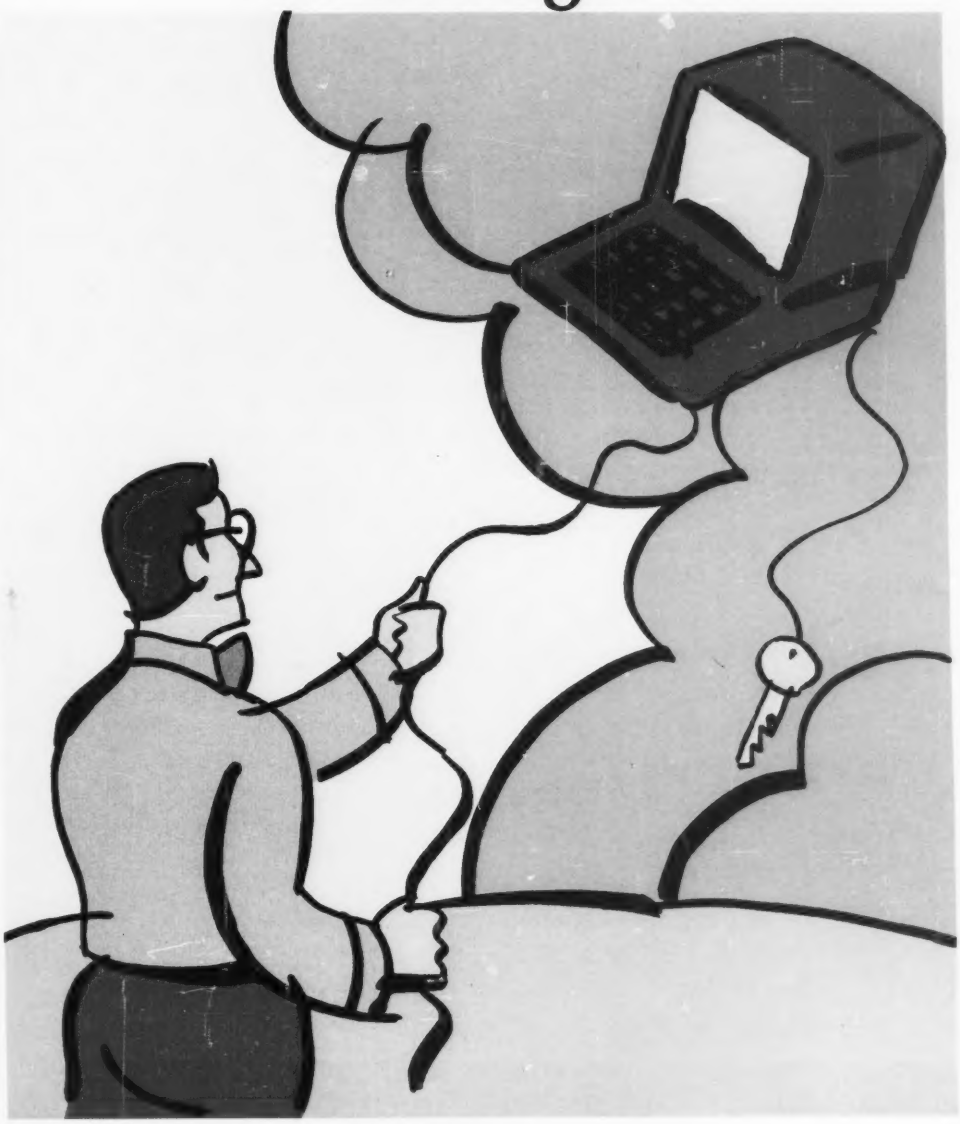
FORECAST '87

Harnessing Forces of Change



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FORECAST '87

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DP takes on extra duty

Development mirrors corporate growth as multilayer processing strategies take shape

BY JAMES CONNOLLY and DOUGLAS BARNEY

MIS strategies for this year and beyond are as varied as MIS professionals themselves.

But despite that variety, common threads — such as the addition of layers of computing, primarily departmental and micro-based systems to augment host systems, and the integration of those systems into an overall data processing environment — run through many organizations.

Many companies are counting more on minicomputers and microcomputers than on mainframes. For others, the strategy is to maintain centralization with minimal use of departmental or remote systems.

Often, the way that MIS is set up mirrors the way the company itself runs — centralized data centers in a headquarters-oriented company and decentralized computer operations in firms organized on business unit lines.

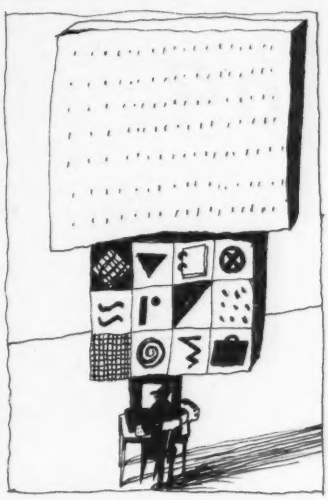
But when the data processing community is examined as a whole, the common element is the growth of processing at all three levels; the mainframe, the department and the desktop.

"Practically everything we do today involves some intelligence outside of our central computer complex," reports David Karney, vice-president for MIS at The Southland Corp., a Dallas-based operator of 8,000 7-Eleven convenience stores.

At Southland, the MIS department is shifting from a long-time centralized organization by moving its systems development operation out to business units.

In general, the nondata center intelligence that Karney mentions rests in approximately 800 personal computers. Southland does most of its computing on personal computers and IBM 3270-type terminals tied to IBM and Amdahl Corp. mainframes.

Much of what the microcomputers are doing for Southland can be classified as new applications and can be seen as an addition to, rather than a restructing of, the firm's data processing environment.



BLAIR THORNLEY ILLUSTRATION

"For the most part, the things we are doing with PCs are things that we were doing by hand. There also are a few things that we really weren't doing at all," Karney notes.

Personal computers are picking up similar responsibilities at other Fortune 500 companies as well.

But for Riley Stoker Corp., a Worcester, Mass.-based division of Ashland Oil, Inc., PCs are not the answer to expanding the number of computer users.

"We are very cost-conscious in the sense that we are not going to spend $3,000 for a PC and software when we can spend $600 and put a terminal on the Digital Equipment Corp. systems. We do have a controlled environment regarding the expansion of PCs, or regarding any sort of experimental-type computing," explains Michael J. Corby, MIS director for Riley Stoker.

Other companies assert that they, too, are not abandoning terminals despite the increasing number of PCs. Southland has replaced numerous dumb terminals with micros, particularly where users run word processing or spreadsheets and need mainframe access.

"But there is still a big population, probably 2,400 dumb workstations out there, because those applications are still being driven by a mainframe IBM CICS application," Karney says.

Like many others, a financial services firm whose MIS director asked not to be identified is adding a second tier between the personal computer and the mainframe. In this case, the second tier is a network of DEC minicomputers.

"This industry always has tended to be centralized, and we have been no exception. But we are looking to break away from centralized processing and away from IBM. Right now we are looking at DEC," explains the MIS director.

"There's a lot of function that we would like to be able to deliver to our branches and divisions — office automation, word processing and, when it is ready, im-

Southland decentralizes, shifts from systems to business units

Mainframe link remains, grows

DALLAS — The shift is to decentralization, particularly in systems development, at The Southland Corp., the operator of about 8,000 7-Eleven convenience stores.

"In the past, we had a very centralized organization, but we recently made a change in our systems development structure in which we shifted our applications development people to the business units," reports David Karney, vice-president of MIS at Southland.

While Southland transferred systems developers to business units such as its distribution operation, the company has not decentralized its main processing. The company expects its mainframe complex, where it runs IBM CICS on an IBM 3090 Model 200 and an Amdahl Corp. 5890 Model 300, to continue to grow.

However, mainframe growth will be slower than in the past, when capacity expanded by 40% per year. Much of the processing capacity growth — linked to new applications — will be in networked personal computers, with use of departmental processors growing more slowly than host or PC applications, according to Karney.

"We are following in the direction of a more decentralized organization with a more distributed systems design," Karney says.

"One of our primary objectives is to focus on the needs of the user community, and that was one of the things that led us to put the programmer function out there in the operating groups. It's easy to build accounting systems from a centralized respect, but when we are talking about systems that support day-to-day operations and support mid-level managers, the programmers really have to be part of the business and understand the objectives," he notes.

At Southland, the shift to decentralized MIS is not a philosophical change. Rather, it is Karney's attempt to have the MIS operation mirror the business operation. "So, as the company changed from a centralized approach to an independent business unit approach, it became clear that data processing had to change to reflect that," he adds.

Under decentralization, developers work in business units using IBM 3270-type terminals tied to the host systems. Only one unit uses departmental systems for production work, the legal department with two Wang Laboratories, Inc. VS100 minicomputers.

In addition, Southland plans to use minicomputers in the distribution operation next year with the addition of processors, such as IBM System/38s, IBM 9370s or Digital Equipment Corp. VAXs.

Southland's Karney

Much of the growth in demand is being absorbed by microcomputers — predominantly IBM Personal Computers — and host systems. The new applications include an in-house-developed videotape rental system, which will allow district offices to use PCs to manage tape rentals at the 4,000 7-Eleven stores equipped with intelligent cash registers.

"With the level of intelligent workstation that is available today and the cost of some of those workstations, we are looking at new structures and systems to offload some activity that really is just a sophisticated data entry application with a lot of validation and testing," Karney claims.

But while the PC-based videotape rental system is under development, 95% of the PC work involves word processing or spreadsheet applications, such as Lotus Development Corp.'s 1-2-3.

Half of the 800 PCs use micro-to-mainframe connector boards. The company also has about 20 Novell, Inc. local-area networks, each linking 12 to 15 PCs in work groups. Karney expects work groups that need communication capabilities will continue to use networks rather than departmental systems, largely because small groups do not justify the use of complex minicomputers that require more support than do networks.

Karney also expects the number of PCs to grow at the expense of dumb terminals, of which Southland now uses about 2,400. He says PCs, rather than 3270s, are being used by people who need tools such as spreadsheets. In addition, Southland will redesign some of its CICS applications during the next few years to offload some mainframe applications to personal computers.

For the average user, the personal computer will continue to be a "vanilla" IBM PC. More sophisticated users and applications, including the videotape rental application, will require the most powerful PC Southland can find.

Offloading applications will not, however, mean a reduction in the mainframe work load, Karney warns. Even as applications are taken off the mainframe, the growth of PC-based applications generates so many files that mainframes will be needed to maintain the data bases.

Because of that, Karney expects disk storage to continue to grow at about 35% per year. "We will still use the central site as a way to pull everything together, so I think we will keep growing the data storage requirements here at the central site quite a bit," he says.

J. C.

Continued from page 3

age. There are a lot of things like that that we don't want to burden our telecommunications network with if we don't have to," he adds.

He says he expects a limited number of general business applications can be migrated to the VAXs, at least for preliminary processing. But he notes that systems and program development will continue to be done in the data center, which will house both IBM and DEC equipment.

But for Tenneco, Inc.'s only oil refinery, departmental systems are not part of the overall strategy.

The refinery uses an IBM 4381 mainframe as the cornerstone of its data processing, relying on terminals and some 20 PCs tied to the mainframe for its end-user computing, according to Warren V. Camp, supervisor of information services for the refinery operations of Tenneco Oil Process and Marketing, a division of Tenneco, Inc. "We are mainly satisfied with our current computer configuration," Camp says.

Even firms that are becoming less centralized than Tenneco report that their mainframe configurations will not shrink. Despite the proliferation of microcomputer networks and minicomputers, those companies expect demands on mainframes to grow — not as fast as the 40% annual growth of recent years, but grow nonetheless.

"Our production systems are still in place and will stay there. What all of this might mean is that we don't grow as rapidly as we have, but, no, it won't reduce it [growth]," the financial services firm's MIS director says. "One thing that is important to remember is that most of these applications weren't being done before or were being done manually. So it's not a case of us throwing out IBM in favor of DEC. The DEC stuff really augments the IBM equipment."

The addition of departmental systems and the influx of microcomputers increase the need to integrate systems.

For Riley Stoker's Corby, that entails eliminating pockets of information. For others it simply means letting machines talk to each other.

The strategies for integrating machines are as varied as the machines themselves. For some, a terminal attached to host or departmental processors is integration. Others stress micro-to-mainframe links, and still others push for departmental systems that tie PCs to mainframes. Just as often, however, firms mix and match all these approaches to meet the variety of user needs.

For Riley Stoker, departmental computing and networking are expected to be fundamentally intertwined. "We may eventually get to localized computing environments where a Microvax may sit in a department, and in order to make that work, that Microvax might be the guardian of the data needed for that department," Corby says. "In addition, through the networking capability, any data that is of interest to other departments would be obtainable through the network."

The Tenneco refinery has a different integration strategy for its 20 or so PCs. "The majority of them are tied into the mainframe. They are just micro-to-mainframe right now," Camp says.

And for Southland, integration takes on a variety of meanings. The firm not only has an IBM Systems Network Architecture network connecting 350 business offices to the firm's Dallas headquarters but next year will have some 4,000 7-Eleven stores on-line to PCs in district offices and connected via IBM 3274 controllers to Dallas to support a new videotape rental service.

Despite the varied means toward the integration goal, it is clear that the addition of computing power and the rising number of end-users make integration a necessity and the MIS manager a prerequisite.

Departmental systems

Capacity expansion

Type	Computing Capacity Index 1986	1991	Average Annual Growth Rate
Remote Mainframes Dumb Terminals	.25	.6	19%
Micro Mainframe / Departmental Mini or Supermicro / PC-Based LAN	.25	1.5	43%
Stand-Alone Micro	.5	.9	12%
Total MIPS Index	1	3	25%

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Pockets of information: Simple goal, complex task

For Riley Stoker Corp. MIS director Michael J. Corby, the goal is simple: Eliminate pockets of information.

But as simple as it may sound, achieving that goal will involve a radical restructuring of the firm's data processing environment, including a new networking strategy and an almost complete overhaul of the firm's existing Digital Equipment Corp. VAX software.

Much of the work has been completed. Already the manufacturer of steam-generating and fuel-burning equipment has introduced a local-area network (LAN) to service a small number of personal computers, and it has tied that LAN into its larger DEC systems through Ethernet.

PCs double as terminals

PCs that are not part of the LAN are far from isolated, but instead double as terminals off the VAX.

"We are going with the Decserver concept so we can hook the terminal up to Ethernet, and they can have access to any or several of the systems available.

"We have also done that with our PC LAN. It is also hooked up to Ethernet so there is the file exchange capability between the VAX systems and the PC," Corby says.

The company has also relegated its 4-year-old DEC VAX 11/785 to the role of a large file server and has connected nine of its recently installed Microvax computer-aided design workstations to the VAXs and the LAN.

"The VAX 11/785 is kind of a hub and acts as an archiving as well as processing machine," according to Corby.

Information base

That is just the beginning. "We are going to build on the concept of providing a common information base, and we are going to do that in the next year more in the software than in the hardware," Corby says.

"Right now our applications software has seemed to have gone the way that the hardware did in the past in that we had information which was not accessible on a corporatewide basis, Corby says.

"It often was replicated, and when you would try to compare it with something that was supposed to be equal, it wasn't," Corby says. The solution, he concludes, is to replace "most of our general business software."

Corby is confident that the already installed hardware provides a suitable base for the new software strategy.

"We are going to use that network of hardware that we have built, in order to deliver the new software and the new information to the hands of the end users," Corby says.

Besides the new software, Riley is expected to implement an ambitious networking strategy within the next few years. One aspect of the networking strategy is said to involve communications with remote sites.

Riley's Corby

"We are planning to do a remote access network with some of our field sales offices, and they will be doing document interchange on a remote basis with PCs.

"It is basically a functional replacement for things like telex and overnight mail," Corby says.

Voice and data

Far more impressive is the plan that may involve the combination of voice and data.

"We are moving to a new building, and we will be restructing the way our data interchange takes place over the network," Corby says.

"We would obviously like to — if the technological developments can happen in time — develop a more close-knit interaction between our voice and data network, which would allow us to transmit through a single cable or a single fiber all of o nternal and external voice and data."

D. B.

Sticking to their mainframe guns

Oil refinery says big central unit easier to manage

While many organizations are installing departmental systems to fill the gap between micros and mainframes, Tenneco, Inc.'s only oil refinery is sticking to its mainframe guns.

The Tenneco refinery uses an IBM 4381 dual processor system running MVS, TSO and CICS. "We run all the general-type financial applications, such as payroll, accounts payable, general ledger, inventory and maintenance work order processing on that system," said Warren V. Camp, supervisor of information services for the refinery operations of Tenneco Oil Process and Marketing, a division of Tenneco, Inc.

Tenneco has no immediate plans to change. "Those applications are going to stay on the mainframe. It is easier to manage, and all those systems are used by people throughout the refinery. We also have users in Houston that use our system," Camp said.

Nor is the Tenneco refinery about to install a raft of departmental systems to service particular work groups. "As far as departmental type machines, I think we are either going to stick with PCs, or, if we need more processing, we will be looking at a PC networking type of thing," Camp said.

Tenneco's Camp

Of the refinery's 750 employees, some 300 currently use some type of computing device, either a terminal or personal computer, Camp stated. That number is expected to increase with terminals leading the charge, at least in the short term. "There are probably more terminals being added than PCs, but that is going to slow, and they will be pretty much even up in the future," Camp said.

The growth in the number of PCs is not expected to reduce the load on the firm's mainframe. "Those applications were just done manually before, and some were done on time-sharing," Camp said.

Despite increasing the number of applications running on PCs, the organization also expects to increase the use of its mainframe. "Where the application is just within a given department, such as drafting, we are looking at putting them on PCs. Where they have refinerywide application, we try to put them on the mainframe," Camp said.

D. B.

TREND-SETTERS

It is hard to talk about Judith Estrin without putting Bridge Communications, Inc. in the same breath. The 32-year-old cofounder calls the company her "pet project."

In the past year, Bridge has gone public, gleaning some $24 million; broadened its product line beyond an Ethernet focus to include a token-ring server; and dropped prices on some existing products.

Estrin is in the middle of it all. Her skills have led her to different roles, and now she is executive vice-president overseeing sales.

The past few months in that post have presented a new perspective for the engineer whose credits include software development at Zilog, Inc. and a short stint in marketing at Ungermann-Bass, Inc.

"I can play both roles, technological sell or high-level observation," she says. "For the time being, this position makes sense," she adds.

"Product planning is always a balance among users' requests, the general market trend and the technology/engineering-driven aspects," Estrin says.

Estrin says she has not lost her technological leanings. She argues that entrepreneur engineers can offer valuable perspective for corporate planning by really understanding the technology behind the products.

But she says she has also had to learn to broaden the engineer's typically focused, analytical approach.

"I still review most of the functional specs from a more passive point of view," she says. "My goal is to make Bridge succeed and do what needs to be done to make Bridge succeed. We can use my talents in different areas. It really depends on where the company is."

During the first few years for Bridge and other young firms, product development was the focus. Now, Estrin says she anticipates some years of maturing.

The year 1987 is one for smoothing the rough edges, and broadening features of existing products as opposed to focusing on a new technology, she says. However, she says she also expects 1987 to be "product-rich."

In 1987, Bridge's and Estrin's plans hinge on integration of personal computers into corporate networking, primarily linking microcomputers with minis and mainframes.

Estrin also says she expects network management to be an increasingly important factor, as networks grow.

"Users ask for better, faster, cheaper, more and more features," she says. "They want functionality, beyond simply connecting."

"I'm one of the most people-oriented" of the upper management, she says. She likes to supplement the usual human services by "instilling it from the top down. It's not enough to have a beer bust once a month."

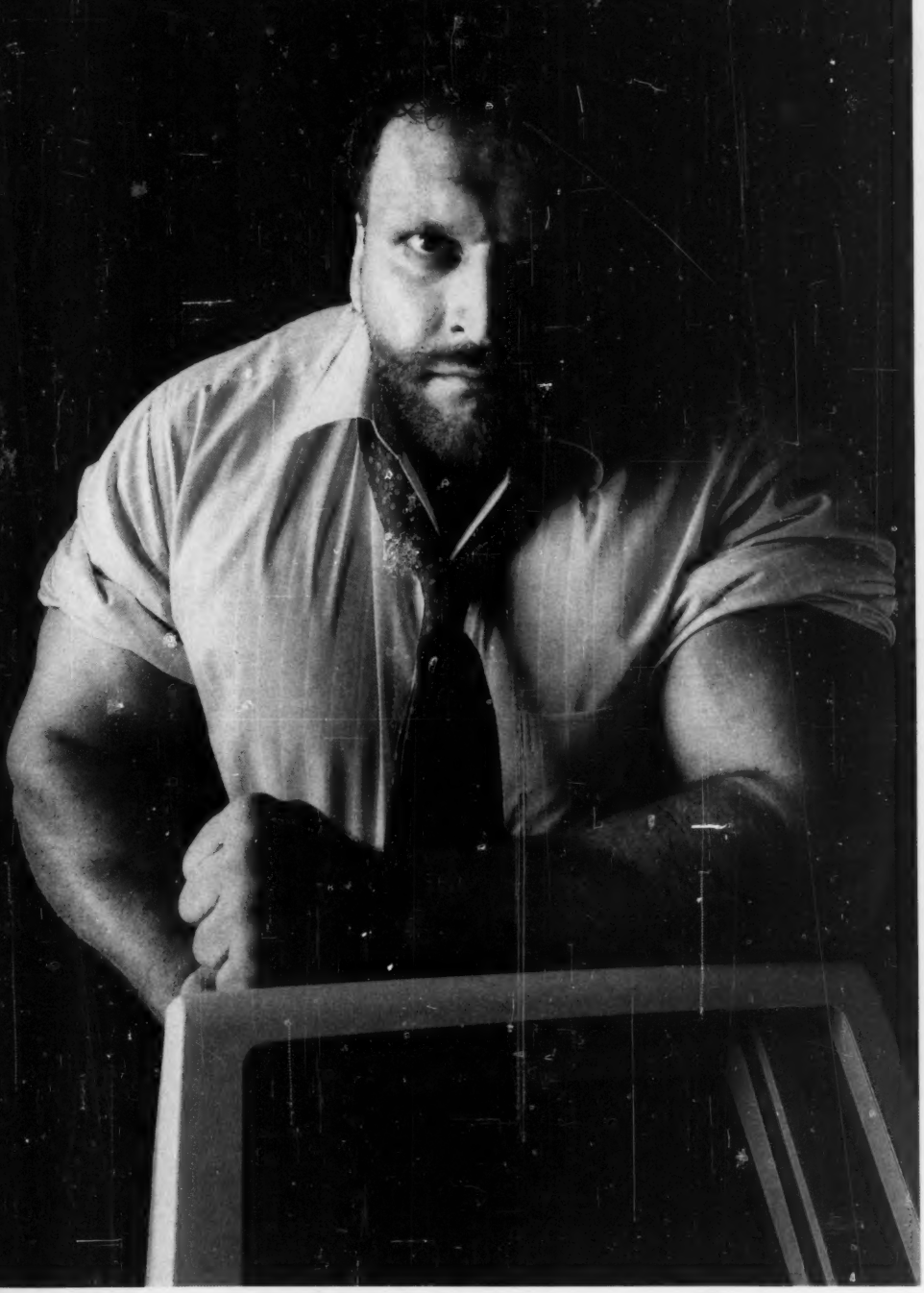
She expects to oversee growth in sales and support next year, and is already adding to the technical support staff and customer services.

"Many of my personal goals are very closely aligned with Bridge," she says.

"I want to continue to be challenged and growing, and perhaps relax a little more, but then, that's my resolution every year."

PEGGY WATT

Taming the wild end user.



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The information budget

Competitive needs, not business climate, driving force in '87 information spending

BY DAVID LUDLUM

Experience has shown that spending on corporate information systems isn't necessarily related to general business conditions — whether for a company, an industry or the nation — and this year is expected to be no exception.

A few factors dominate the determination of information systems spending, with business conditions playing a minimal role, according to experts.

Most information systems spending by large corporations is determined by how executives view their long-term competitive needs, rather than by the business cycle, according to Theodore Freiser, president of John Diebold & Associates. The business cycle doesn't affect long-term views on how to be an effective competitor, he adds.

Paul Clermont, a principal with consulting firm Nolan, Norton & Co. in Lexington, Mass., points to the recent past in contending that information systems spending tends to bear no strong correlation to the business cycle. "An awful lot of it was concentrated in the early 1980s, when one could not say business was good," Clermont notes.

One reason for this is that spending often reflects past commitments to develop systems that take several years to complete, says John J. Connell, executive director of the Office Technology Research Group in Pasadena, Calif.

Information systems spending during a period of five years, for example, may reflect the trend in business conditions, but many of the factors determining spending levels for this year were put in place several years ago, according to Connell.

That is borne out by the experience of the Pillsbury Co. in Minneapolis, where the most important factors behind information systems spending are strategic needs, according to John Hammitt, vice-president for information management.

"It [spending] is driven by strategic concerns as opposed to short-term change in the business environment," Hammitt says. Pillsbury's information systems spending will rise substantially this year as a result of a strategic drive to make up for a lack of it in the past, Hammitt says.

ANTHONY RUSSO ILLUSTRATION

Companies, particularly in service industries, might intentionally boost information systems spending in the face of a weak business outlook, says Joseph Brophy, senior vice-president of data processing at The Travelers Corp. in Hartford, Conn.

"Business conditions could be worsening and there still would be an increase in information systems spending if that's viewed as a solution," Brophy says. The spending might be aimed at cutting costs or furthering initiatives in marketing or other areas, he adds.

Clermont of Nolan, Norton says he sees two principal forces driving a lot of information systems spending — the threat posed by such spending on the part of competitors, prompting companies to follow suit, and the entrepreneurial drive of those who manage information technology.

The financial services industry is one in which information systems is being aggressively driven by competition and entrepreneurial energy, according to William Anderson, senior vice-president and director of the Information Systems Division of Prudential-Bache Securities, Inc.

"For firms aggressively competing in the financial services business, I believe systems activity development is crucial at this time," Anderson says. A key element is competition to provide global services, which has prompted U.S. securities firms jockeying for a role in London's newly invigorated markets to double their organizations there in the last 20 months, he says.

Of course, not all information systems spending is strategically driven. At Pillsbury, Hammitt identifies three classes of spending — strategic; a more discretionary, tactically oriented component that includes such things as maintenance; and routine pro-

duction, which is largely driven for efficiency in the short term and tends to show stable growth. (End-user computing, financed by users at Pillsbury, constitutes a fourth, somewhat separate, area.)

Strategic information systems spending is not without its own cycles, according to Diebold's Freiser. Companies tend to go through phases of growth and consolidation, he says. "There's only so much movement a company can absorb before it has to digest."

That does not mean pressure to cut costs is not placed on information systems departments due to business conditions, Freiser says. However, freezes or cuts can be accommodated without affecting long-term direction, in part through use of contracted services or by leasing rather than purchasing.

While technological innovation may provide opportunities for increased information systems spending, it is "an enabler rather than a driver," Clermont says. How much an individual organization responds to innovations depends on other factors — competitive threats and entrepreneurial drive — although in the absence of innovations there is likely to be less spending.

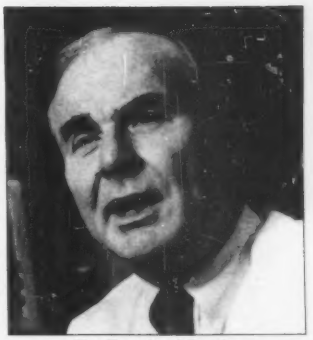
Observers tend to predict at least a modest increase in information systems spending this year and bigger boosts in financial services.

Clermont says Nolan, Norton sticks to a forecast of an average 20% yearly growth rate for the decade but that the increase for 1987 will be closer to the modest ones of the past two years than to those of the go-go early 1980s.

Connell of Office Technology Research calls for a more distinct departure. "I think you're already seeing a gradual increase in spending levels after a two-year hiatus," he says, calling for "a demonstrable improvement over 1986." The increase will not be across the board; rather, he predicts growth will remain strong for mid-range processors and weak for large systems and microcomputers.

At the Travelers, this year's rate of increase hasn't been finalized but will rise for the first time in five years, Brophy says. Growth in 1986 was 12%, he adds.

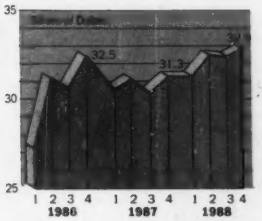
At Prudential-Bache, 1987 will be "a very agressive growth year for data processing," Anderson says. "I would say I'm loooking at a 35% increase," not including voice and data communications, he concludes.



The Travelers' Brophy

Spending outlook

U.S. purchases of office and store machinery, including computers



Information provided by Data Resources, Inc. in Lexington, Mass.

FORE-CASTERS

"There is now a transformation in the industry from data processing to information processing. The difference is in the processing that takes place," says Charles Mathey, senior staffer with The Futures Group in Glastonbury, Conn. "From 1990 to 2000 we will be moving from information to knowledge — information that has been processed. Right now we're trying to make the jump from information to knowledge."

Mathey says there are already computers capable of transforming information to knowledge without human intervention. He cites an experimental neural network computer, programmed with 1,000 words and the required phonemes for English, that taught itself to read aloud. "It can do this in a couple of days and pronounces the new words properly," he says. However, he adds, in some ways it scares him.

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Mixed economic bag seen for U.S. industry

Oil firms, federal budgets shrink, insurance grows

BY JANET FIDERIO

Economic forecasts are not just for your chief financial officer. An MIS manager who is savvy regarding economic and business affairs may have a head start when it comes time to anticipate and respond to corporate information needs.

The following snapshot projections of growth in the insurance, banking, oil, government and manufacturing sectors have been gathered from financial analysts and economists.

These projections are one of many tools that MIS and other management professionals can use to anticipate capital spending on items such as major computer equipment.

Insurance. This year is going to be profitable for the insurance industry. Rick Samartino, a banking and financial services analyst at Argus Research Corp., a Manhattan-based independent investment advisory, says he sees "the continuation of strong growth in the 25% range for diversified insurance companies and 35% to 40% growth for the property/casualty companies." The property/casualty industry typically follows a cyclical growth pattern that is composed of three up years followed by three down years.

Strong 1987

According to Samartino, 1985 settled at the bottom of the cycle, followed by 1986 as the first up year. Samartino says, "1987 should be another strong year, while 1988 will probably start to peak."

Elizabeth Malone, an economist for Alex Brown & Sons, an investment banker and broker, also notes the growth cycle of property/casualty companies. Yet Alex Brown economists are projecting a higher, 40% growth in earnings in 1987 and 15% to 20% growth in 1988 for these firms.

"Property/casualty companies are in the middle of an up cycle." Malone says, "so growth is pretty robust right now."

Higher earnings, Malone claims, should translate into increased capital spending in this sector. Alex Brown economists also predict 12% to 15% growth in earnings for life insurance companies but, Malone says, this "trend could slow down in 1988 due to continued low interest rates."

Banking. Early forecasts in the banking area are calling for flat growth in 1987. According to Mark Biderman, senior vice-president at Oppenheimer & Co., a Manhattan-based investment research firm, bank earnings are going to be under pressure this year.

"Banks have been spending a lot of money in expansion, particularly in the capital markets area." Because of the lack of revenue growth, Biderman claims, banks "are going to be trimming their expenses," and capital spending for the likes of computer equipment will be down.

Argus Research's Samartino is also looking for a fairly flat, 3% to 5%, modest growth year for money-center banks. Robert J. Eggert, economist and editor of "Blue Chip Economic Indicators," a newsletter that reports the consensus positions of 51 forecasters, continues to see banking as expanding its operations and remaining a steady part of the economy in 1987.

Petroleum Industry. Oil industry forecasts for this year are mixed, but for the most part, economists predict another down and out year.

William Brunet, vice-president of research at the Advest Group, a Hartford, Conn.-based investment research firm, says that growth in the sector's income will depend on what happens to stabilize prices.

He projects that prices will rise and that the industry can look forward to a better year than last. OPEC may well be able to accomplish higher price levels, according to Brunet, who estimates prices should hang in the $18 to $19 a barrel range. "Prices last year were considerably lower than that," Brunet says.

Catherine Montgomery, vice-president of exploration and production at Merrill Lynch, Pierce, Fenner and Smith, Inc., says she sees a terrible year ahead for the oil industry.

According to Montgomery, the industry is basically in consolidation — it is in a no-growth mode.

"Oil companies have experienced a very sharp drop in their cash flow," Montgomery reports. Consequently, she predicts radically low capital spending industry-wide.

Sara Johnson, senior economist at Data Resources, Inc., a Lexington, Mass.-based economic forecasting firm, has noted that oil prices will stop declining in 1987 and that "the industry will hit bottom in late 1986 and then will begin to turn upward." Although she says she sees that annual averages in drilling and profitability might be lower next year, she adds that she anticipates some turnaround.

Federal Government. As for government spending, don't be surprised by another slow year in 1987. According to "Blue Chip" Editor Eggert, the government will continue with Gramm/Rudman budget cutting.

"The pulling back of the deficit will decrease the government's expenditures," Eggert says. "Military expenditures may continue to go up a shade, but the other types of government expenditures will be on the downward path," he adds.

Data Resources' Johnson reports that she also sees federal government spending as being a weak sector of the economy.

"The federal government's budget in fiscal 1987 will provide about a 1% increase in nominal spending, but after taking inflation into account, this means a drop in real services."

Manufacturing. Due to the manufacturing industry's diversity, it is difficult to track general growth. One way to track trends in the sector, however, is to follow appropriations and expenditures.

According to Walt Arvin, an economist for The Conference Board, a New York-based research organization, the latest figures from The Conference Board's survey of the top 1,000 manufacturing firms show actual expenditures for the 1986 third-quarter project to "a 5.6% decrease from the previous quarter."

Appropriations in the third quarter showed a 1% increase from the prior quarter. Although these are 1986 figures, appropriations usually carry over half a year to a year.

What is holding these figures down, according to Arvin, are low expenditures and appropriations in petroleum, motor vehicles and chemical manufacturing. The economist adds that the survey also shows durable goods industries are outperforming the nondurables industries.

Data Resources' Johnson concludes that this year will be a tough one for businesses that produce capital goods, in that these companies will see their sales weakening as a result of tax reform.

Economic forecast for 1987

Insurance is on the upswing. 1987 looks like it will be a boom year in the insurance industry with property-casualty companies leading the pack with projected growth in the 35% to 40% range.

Banking holds its own. Flat growth may mark the new year for the banking industry. Expansion continues along with modest growth.

Oil firms face hard times. Although industry prices may be on the rise, it will take awhile before these companies rebound.

Government budgets continue to dip. Gramm-Rudman budget cuts make their mark once again in federal spending. Look for government expenditures to be low.

Manufacturing's mixed bag. General expenditures for the coming year so far show a slight decrease. 1987 could be a hard year for companies that produce capital goods.

CW chart

Gray economic skies forecast for 1987

Four out of five economists surveyed are predicting a slow economy in 1987, and one is predicting a recession.

The "Blue Chip Economic Indicators" newsletter, which contains the concensus of 51 economists, projects an average real gross national product (GNP) forecast for 1987 of 2.5%. This consensus forecast dropped a full percentage point below the expected gross rate for 1987 witnessed just six months ago; last June the group projected an economic growth rate of 3.5%.

According to economist and "Blue Chip" Editor Robert J. Eggert, the first quarter of 1987 is expected to be the weakest period of the year, with a projected growth of just 2.1 %.

The "Blue Chip" concensus also predicts inflation will rise just 3.2%. The spread between the top 10 and the bottom 10 economists of this forecast, says Eggert, is narrow. "The top 10 say 3.8%, the bottom 10 say 2.4%, which normally suggests greater accuracy in the average."

GNP growth

Sara Johnson, senior economist at Data Resources, Inc., also projects real GNP growth will be at 2.5%, about the same as in 1985 and 1986. "The leading sources of growth will be exports next year," Johnson predicts. "Dollar depreciation should finally mark a rebound in exports that will in turn generate income and purchasing power from our consumers and businesses, but the weak sectors will be capital spending and federal government spending," Johnson adds.

Inflation, according to Johnson, will turn upward in 1987 because oil prices will no longer be declining. "During 1986 we realized the benefit from a 60% drop in crude oil prices. Those prices are now stabilizing and perhaps moving upwards."

Without that downward pressure on inflation, according to Johnson, the economy will see a higher inflation rate.

Economists Gerd-Uls Krueger and Walt Arvin of The Conference Board estimate the annual growth rate for GNP in constant 1982 dollars will be 2.1%. "We are not expecting a big turnaround in the economy," Krueger says. "To some degree we expect that the trade balance will improve but not dramatically. Forecasts that predict a higher GNP growth in 1987 predict a better improvement of the trade deficit in the U.S. economy."

The survey's lone economist in predicting a recession in 1987 is Jay Levy, of Levy Economic Forecasts, Inc., the Chappaqua, N.Y., publisher of "Industry Forecast."

"The only likely way to avert a recession is a big improvement in the balance of trade," Levy contends, which he thinks is unlikely.

"We expect some improvement," Levy asserts, "but not soon enough and not big enough."

J. F.

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Network pressure: Managers seek remedies

Integrating resources is top concern

BY ELISABETH HORWITT

Four managers who have extensive, ongoing responsibility for coordinating their companies' communications strategies during the next few years have all taken the risk of purchasing untested and/or unperfected products rather than waiting for vendors to come up with the perfect solution to their needs. Not all of the companies are on the leading (or bleeding) edge of networking technology, but all have often played the role of vendor guinea pig and have been forced to develop in-house whatever crucial pieces are missing.

Several of the firms discussed here have recently embarked on a new level of systems integration, part of the long-range goal of enterprise networking — making the widest possible range of corporate data and computing resources available to the greatest number of employees — using the minimum budget needed for the job.

▶ **WILLIAM FRIEL, vice-president and director of systems and data processing at J. C. Penney Co.**

The giant department store chain is principally concerned with finding better ways to manage, update and operate its extensive network, which consists of some 40,000 point-of-sale terminals, 30,000 dumb terminals and hundreds of personal computers as well as 700 IBM Series/1 Systems Network Architecture (SNA) gateways to IBM 3090 and 3080 mainframes and an assortment of other systems.

"Do we need peer-to-peer networking? Yes. Do we need distributed processing architecture? Yes. Are there software solutions now? No," Friel says.

J. C. Penney's current hierarchical SNA network "is based on a master-slave relationship, which means you spend a lot of time doing nonproductive polls, finding out if someone in a remote site wants to send," Friel says. In a peer-to-peer relationship, "one system just says to another, 'I want to send something, here it is,' " he adds.

IBM's peer-to-peer networking protocol, LU6.2, is "just a concept, like ISDN [Integrated Systems Digital Network]. It won't be here till 1990 or 1995,"

Continued on page 14

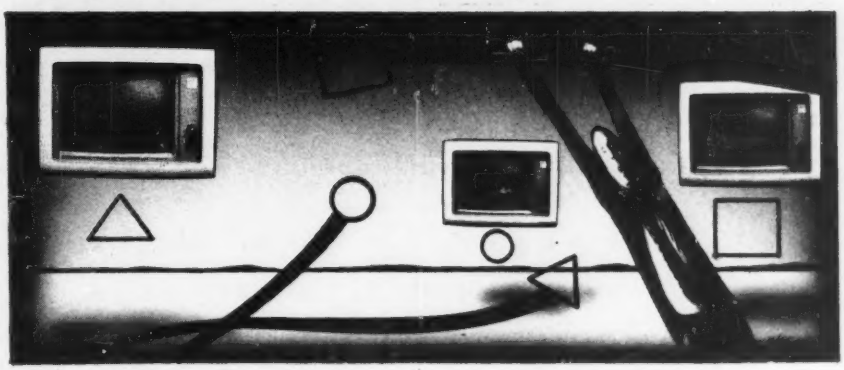
▶ **KENNETH JANKOWSKI, manager of network services at TRW Corp.**

Jankowski is struggling with the increasingly common problem of how to integrate customer premises equipment with a wide range of carrier telecommunications services while still maintaining control of networking resources and applications.

The company currently uses an internal communications system composed of AT&T System 85 PBXs and ESS switches that are linked together by dedicated T1 1.5M bit/sec. lines and AT&T's Electronic Tandem Network (ETN) software. During the next 12 months, TRW is replacing the ESS-ETN elements of its voice network with AT&T's Software Defined Network (SDN). The service's rate structure offers cost benefits to companies like TRW, which have multiple sites that need to communicate regularly. SDN also offers a multisite uniform numbering plan that TRW plans to integrate with its existing plan, Jankowski says.

SDN will support TRW's dial-

Continued on page 15



CARL WESLEY ILLUSTRATION

▶ **WILLIAM THOMPSON, senior planning analyst in communications, office automation and office information services at Black & Decker Corp.**

Black & Decker is looking for ways to manage its exploding population of personal computer users — particularly in the area of mainframe data base access. "We can't afford to install 200 more Digital Communications Associates, Inc. Irma cards and 200 modems" for each new batch of users, Thompson says. "Especially since we have to keep upgrading modems every time vendors introduce models with more speed."

The company has already solved this problem, at least partially, by installing AT&T's intelligent switch, Information Systems Network. The switch provides micro users with shared access to asynchronous and synchronous hosts as well as to a pool of modem-based connections to the outside world. This eliminates the need to equip each PC with its own Irma card and modem.

A larger problem faced by the firm, however, is making multiple data bases on multiple hosts available to hordes of PC users. Black & Decker is waiting for the right products to appear before it seriously considers a distributed departmental processing system. The company has been put off by the current high cost of "the hardware and of managing and maintaining data so that it stays synchronized across all of the machines" and so that users do not end up accessing 3-week-old data, Thompson says. "We don't need that kind of trouble."

A major user of Cullinet Software, Inc.'s IDMS data base management system, Black & Decker is consolidating its data "so that I can provide a connection from the user's desk to where the data lies," Thompson says. Cullinet's Information Center Management System and Infogate software will provide data base access to end users on the application level.

The company is experimenting with the idea of putting the Unix version of Information Builders, Inc.'s fourth-generation languages, Focus and PC Focus, on different models of AT&T's 3B computer line to support different-size work groups. "Down the road, we'll need to have one machine talking to another so that users can request data on one machine and it will know where to find it," Thompson says. A lack of products to make this happen "is what is holding back distributed processing," he adds.

"Sure I'd like to have it all handed to me on a plate, but you can't get that with new technology unless you wait until it's all perfected," Thompson says.

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RESPONSE

MICHAEL ZISMAN, chairman and chief executive officer of Soft-Switch, Inc.

"When you have a large, multivendor network, you need a facility that maps a user or file name to a node. You need a directory of resources.

"Different vendors are attacking the problem from different angles: IBM, with its grand idea of a repository, the data base vendors like Relational Technology, Inc. and Oracle Corp. have a war on around their distributed data base products and we will have a solution of our own next year."

Continued from page 13

Friel notes. "A few companies, like Communications Solutions, Inc. and, to a lesser extent, IBM, support it; the real issue is when all systems used by us . . . will support fully functional LU6.2 and PU2.1 networking."

William Friel

A much more serious problem from J. C. Penney's point of view is the fact that the process of adding new nodes and addresses on the SNA network is still "tantamount to taking the whole subnetwork down," according to Friel. J. C. Penney has been waiting for IBM to come up with a way to dynamically add nodes without going through a system generation each time.

A third concern for Friel's people is "how to make the network management job easier." J. C. Penney is interested in IBM's Netview concept of SNA-based centralized network management. "We centrally manage our network right now from our three data centers, but it's costly and a real pain," Friel gripes. "We would like to see improvements."

RESPONSE

WILLIAM WARNER, director of business and systems management at IBM, responds to William Friel.

Continued on page 16

STEVEN JACKSON, vice-president of systems and MIS and technological planning at First National Bank of Chicago.

Some years ago, First National Bank of Chicago made a policy decision to allow different user communities to choose whatever communications system best filled their needs.

Now, like so many other companies that provided that freedom to users, First National is pressuring its vendors to come up with products that can link their incompatible office automation networking architectures.

"What we need in our company is a homogeneous delivery mechanism that allows us to move information from one system to another — whether it is Wang Laboratory, Inc.'s Wang Office, Digital Equipment Corp.'s All-In-1 or a local-area network file server," Jackson says. The bank plans to introduce at least two more electronic mail systems to meet the needs of its users, he adds. "The good news is that the systems can be cost-justified. The bad news is that they need to be connected," he says.

Steve Jackson

The bank is looking for a communications system that enables a user to receive documents from users on other systems "as if they were part of his own system," Jackson says. The key component is a central directory that keeps track of where users are day and night and tells hosts where to send documents. Another component is peer-to-peer communications gateways that allow various hosts to trade documents between their respective electronic mailboxes.

"We don't care about peer-to-peer connectivity between workstations," Jackson says.

The bank shared its vision with vendors several years ago, but the vendors have been slow to respond, Jackson says. "They want to do it all. Over the last few years, market demand for intervendor connectivity has approached critical mass. Companies are saying, 'We won't buy any more boxes until we can integrate your systems,' " he says.

Vendors have begun to respond to this pressure by developing interconnection products, according to Jackson. While unwilling to go into particulars, he points to Softswitch, Inc. as a likely candidate for providing the eventual solution.

Jackson is also concerned with maintaining cost accounting and message verification for communications among and within user communities. "It doubles the cost of transmission if you have to verify delivery," he concludes.

RESPONSE

MICHAEL ZISMAN, chairman and chief executive officer of Soft-Switch, Inc., responds to Steven Jackson.

"Right now, our products provide some [distributed electronic mail directory] capabilities. Right now, a user can send a message to his Wang Laboratories, Inc. Office system, which knows that the recipient is on a Digital Equipment Corp. All-In-1 system.

"Integration of directory services is next; once people connect to electronic mail systems and the user population grows, the problem is to keep track of where people are, so you need direct interconnection between different vendors' electronic mail systems.

"We and the major host vendors intend to address that problem."

Continued from page 13

up data traffic as well. The remainder of the company's data traffic will be handled by dedicated terrestrial and satellite links as well as a variety of AT&T data services.

TRW plans to send voice, data and video transmissions through high-speed (9.6K bit/sec. or T1) dedicated links to AT&T facilities, where they will be routed to the appropriate service. The major difficulty lies in keeping track of individuals' use of different network services, according to Jankowski.

Once transmissions reach AT&T's central office, it becomes difficult to "separate out different transmissions and say who is working on what," Jankowski complains. "As we move toward electronic linkage with our suppliers and customers, accountability is crucial. AT&T will provide billing by site, but not on a telephone-by-telephone (or terminal-by-terminal) basis, he adds.

Right now, Jankowski knows of two equally unacceptable ways to deal with this problem. It can install black boxes at each site to keep track of network usage internally, "which is not cost-effective and creates maintenance problems," Jankowski says. Or, the company can have employees add an extra 5- to 11-digit authorization code each time they dial. This is likely to be unac

Continued on next page

Continued from page 14

"When a terminal or controller or communication line is added to an IBM Systems Network Architecture network, it is often necessary to take a portion of the network down, causing a certain amount of disruption of service and lower availability, which can cost money for some industries.

"This is an important concern for most of the customers I talk to that have large, widely dispersed networks.

"We already have something done within IBM's architecture that leads to a solution; we know it has to be provided to customers in the near term.

"IBM will continue to develop wider, more pervasive LU6.2 connections for our own products.

"What customers want is a richer implementation — which means opening up access to LU6.2 facilities, for example, and enhancing VTAM's programming interface to provide LU6.2 capabilities. We'll be doing that."

Continued from page 15

ceptable to most employees, according to Jankowski.

TRW's problem will be solved eventually, Jankowski hopes, when AT&T and other carriers adopt the Integrated Services Digital Network (ISDN) standard, which can handle complete accounting and network management information on a separate channel. In the meantime, the company is working with PBX vendors and with AT&T to find a short-term solution.

Jankowski is also waiting for ISDN to provide an effective way to integrate TRW's IBM host-based communications into a telecommunications network. The company recently passed up an invitation for TRW to participate in an ISDN trial because of the lack of a primary rate connection for TRW's IBM 3725 communications processors. The primary rate defines 23 64K bit/sec. digital channels as well as a separate channel for signaling. "I wanted a single T1 fire hose whose logical channels could be handled by ISDN. That will take a while to happen," Jankowski says.

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RESPONSE

WILLIAM WARNER, director of business and systems management at IBM, responds to Kenneth Jankowski.

"It is clearly up to manufacturers that produce devices that interface with the carrier services to provide basic and primary Integrated Services Digital Network [ISDN] support — it is not the operating companies' responsibility to provide ISDN attachments for other companies' customer premise equipment.

"ISDN support is part of our architecture direction. *How* we link to ISDN — through a separate product or integrated into our current products — is still under assessment."

PHIL STASAEWICZ, Software Defined Network product marketing manager for AT&T, responds to Jankowski.

"In the first quarter of 1987, we will provide a new type of billing arrangement for ISDN, a breakdown by project center and division, rather than an overall summary bill. We may not offer breakdown by originating location as a standard billing format now, but we could offer it through customized reports. We are also seriously looking down the road at customer access of our [accounting] data base on a real-time basis.

"Right now, we provide a magnetic tape that contains raw billing data which customers can manipulate themselves.

"Different AT&T services currently have discrete billing. As we provide call-by-call selection of services through ISDN, we will definitely be looking at how to provide billing for that arrangement."

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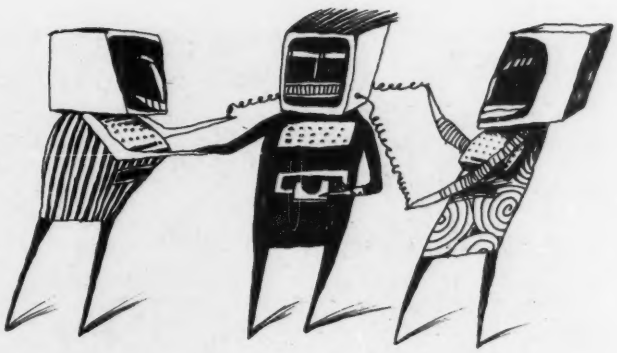


BLAIR THORNLEY ILLUSTRATION

BY STANLEY GIBSON

IBM has begun the long and arduous process of tying its several incompatible architectures together. Connectivity products upon which IBM can be expected to build in 1987 include the Netview network management system, the merger of the System/36 and System/38 lines and the 9370 line of computers.

Despite IBM's sometimes Delphic pronouncements about the future, most analysts agree that, in general, the industry giant will continue to move from hierarchical to peer-to-peer networks within Systems Network Architecture (SNA).

At the same time, IBM will continue to consolidate its architectures, a path that could lead to a single architecture sometime in the 1990s. In addition, IBM will hedge its bets by supporting both SNA and Open Systems Interconnect (OSI).

At present, IBM has three different kinds of peer-to-peer networking: IBM subarea SNA, IBM's mainframe coupling method; Advanced Peer-to-Peer Networking (APPN), for System/36 and 38 minicomputers; and Transparent Services Access Facility (TSAF), a VM-to-VM communications function announced with the 9370. How the three will evolve and possibly merge remains a topic of speculation.

"There will be years to go before you see IBM's subarea migrating to APPN structure," says Frank Dzubeck, president and chief executive officer of Communications Network Architects, Inc. in Washington, D.C. But, he cautions, "The APPN of today is not necessarily the APPN of tomorrow."

Bill Warner, director of business systems management at IBM's communications programming lab in Raleigh, N.C., says Low Entry Networking (LEN), sometimes referred to as APPN or PU2.1, is a key component in the evolution of SNA.

"It is a goal to bring the System/36 to backbone SNA through LEN. This enhancement to LEN is a key customer requirement." Of SNA he adds, "SNA has been and will continue to be our strategic networking architecture."

"SNA will be the center of IBM's multivendor strategy, but the basic nature of SNA will have to change," observes Claire Fleig, an analyst with the International Technology Group in Los Altos, Calif., adding that an eventual peer-to-peer SNA must extend beyond the mainframe world.

At an IBM-sponsored meeting for analysts in October, according to Fleig, IBM representatives said APPN will be extended to architectures other than the System/36 and 38 that it now serves but will not communicate directly with a mainframe. To do so, an APPN-to-mainframe interface will be required.

TSAF, now limited to the 9370, may evolve into a general-purpose mainframe link, Dzubeck suggests. "TSAF for mainframes, intermingled with APPN, may be the APPN of the future," he says.

Another key requirement for SNA users, Warner says, is in network availability — to allow users to add components to a network without taking the network down and thereby interrupting the work of end-users on the network. "You should be able to add terminals, multiplexers, even computers, without disturbing the network," he says.

In addition, he says, expanding the address limit of SNA is required in order to reach the ultimate goal of making SNA more like the consumer telephone network. "This will evolve over the next five years. It's not a next-year thing," Warner says.

What shape IBM's connectivity will eventually take will be contingent on what architectures emerge from today's current collection. In the mid-range, IBM will erase the differences between architectures, according to Brian Jeffery of International Technology Group. That process was begun in June 1986, with the announced connection of the System/36 and 38, he says.

Continued from page 17

However, linking 9370s with System/36s and 38s is also a goal. This process is already under way with the announced sharing of peripherals among the 9370 and System/36 and 38, Jeffery points out. Ultimately, he says, the aim is to give the user transparent access across the entire mid-range.

Despite SNA's status as a virtual industry standard of networking, IBM will continue to support OSI, according to Rudolf Strobl, an analyst with Arthur D. Little, Inc. in Cambridge, Mass.

"I think IBM will be the leading OSI vendor. They're the one vendor that's really implementing and moving rapidly," Strobl says. IBM has introduced OSI products in Europe and Canada and will implement more in the U.S., Strobl says. IBM will support both SNA and OSI on the System/36 and 38, Series 1, System 88, IBM Personal Computer AT, Rolm Corp. CBX, 9370 and MVS 370, Strobl asserts.

"Although we don't see a lot of OSI products from other manufacturers now, we know they are coming. . . . IBM has OSI products in Europe and will be introducing these in America," Warner says.

One such product could be the General Teleprocessing Monitor for OSI, which was unveiled in Europe in September. The product helps developers create OSI applications on 370-based processors running MVS/SP. It will also allow user-supplied SNA or OSI application programs to communicate with each other, IBM says.

'IBM will be the leading OSI vendor. They're really implementing and moving rapidly.'

RUDOLF STROBL
Arthur D. Little, Inc.

In addition to supporting OSI, Big Blue will continue the multivendor theme in the arena of physical media by supporting Ethernet as well as its own Token-Ring network.

IBM's RT Personal Computer supports Ethernet connections, which are necessary for its assimilation into the world of engineering. The 9370 was also announced with Ethernet connectivity.

Repeating the multivendor theme, Netview will tie together the equipment of many vendors into a corporatewide network management system. In addition to Rolm, seven other vendors announced Netview interfaces in 1986. Many more should follow suit in 1987, according to several observers.

Netview and support of OSI and Ethernet reveal a key business decision on the part of IBM: Openness will benefit its bottom line.

"IBM doesn't care whether they sell Ethernet or Token-Ring as long as the network helps sell computers," Strobl says.

Meanwhile, IBM's Token-Ring network will be upgraded in 1987 to transmit at 10M bit/sec. from its present 4M bit/sec. according to George Colony, president of Forrester Research, Inc. in Cambridge, Mass. IBM's Warner would not comment on when this might happen, but did concede that "customers will need this eventually."

Brian Jeffery

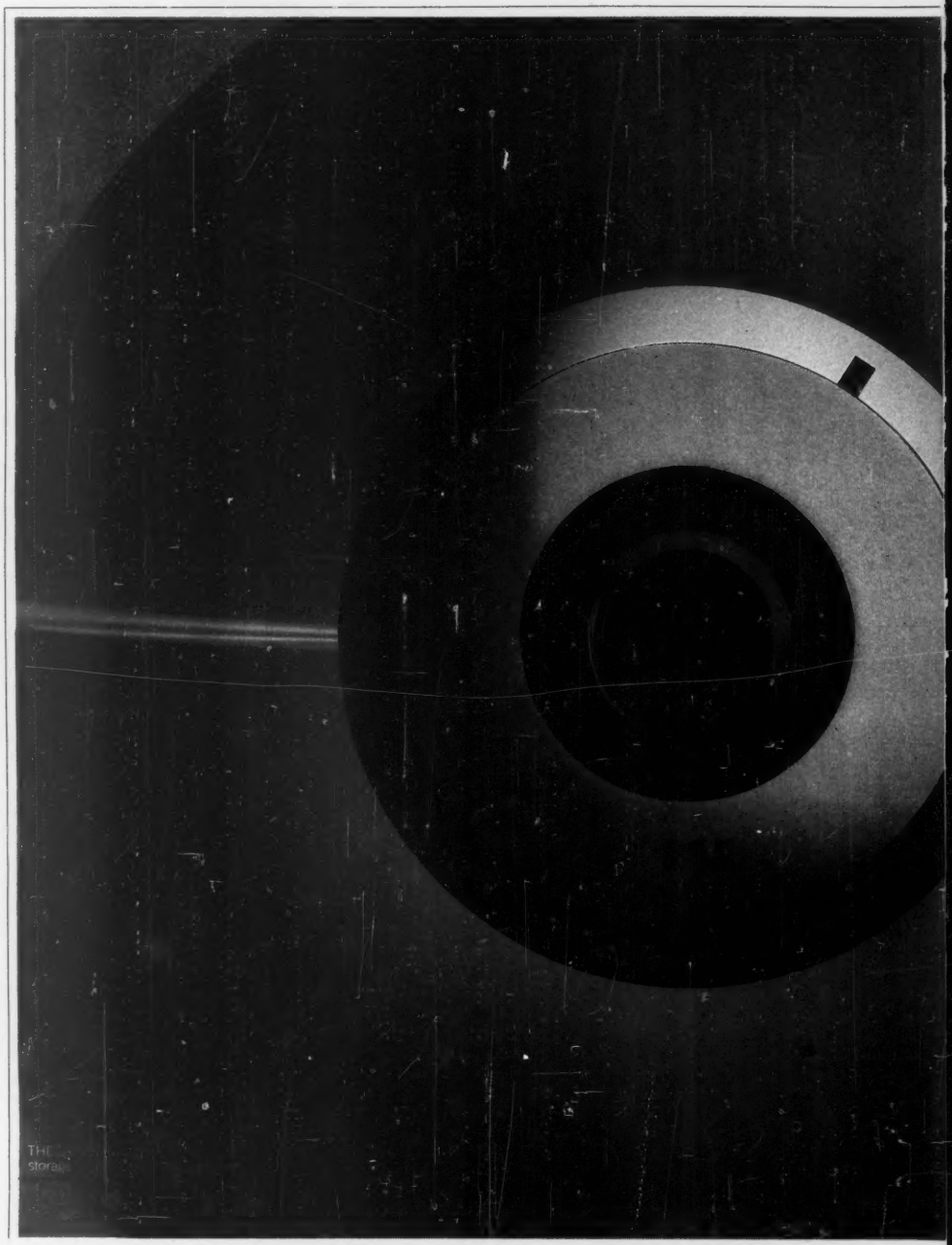
The connectivity progress that IBM makes in 1987 could not be more important to the company's future. Industry analysts point to connectivity problems as a cause of the firm's lackluster growth in sales and declining profits during the last two years. They also point to Digital Equipment Corp.'s ease of connectivity as a reason for its recent success.

"The difference between IBM and DEC has to be technological. Deliverable communications strategies — that's the problem. IBM has got to do what DEC has done, do it rapidly and do it accurately. It needs seamless data access," says Bernie Wess, a former consultant and now chief operating officer of Grand Alliance Insurance Co.

The changing nature of U.S. corporations means that IBM must act now, Wess says. In many organizations, mid-level management is being cut out. Consequently, computing is moving down to departments. Ease of data communications between departments will become an important strategic asset for companies, Wess explains.

But when the question comes to who will win the connectivity battle in five years, Wess concedes, "IBM can always still win."

The year 1987 will be when IBM delivers all the products it announced in 1986. The implementation of those alone should change the communications landscape considerably.



IBM 9370 set to do battle

As the strategic mid-range product responding directly to the connectivity challenge posed by Digital Equipment Corp., the IBM 9370 will play a key role in the coming year. But just how far IBM will go in tying the 9370 family of distributed processors into its other systems is an area of lively speculation.

Members of the 9370 family communicate with one another via Transparent Services Access Facility (TSAF), which provides VM-to-VM connectivity. However, TSAF raises eyebrows in that, although it has an LU6.2 programming interface, it does not include LU6.2 itself.

Rudolf Stroble

Bill Warner

"IBM 9370 TSAF presents an LU6.2 programming interface to the user. However, the underlying protocols are not LU6.2 protocols. TSAF is intended for interconnecting 9370s in a collection," says Bill Warner, director of business systems management at IBM's communications programming lab in Raleigh, N.C.

However, Warner says 9370s will eventually get a full LU6.2 implementation, as will all VM-based systems running VTAM, including 370s, 4300s and 3090s. Warner will not be specific as to when this might occur, but he won't rule out this happening in 1987.

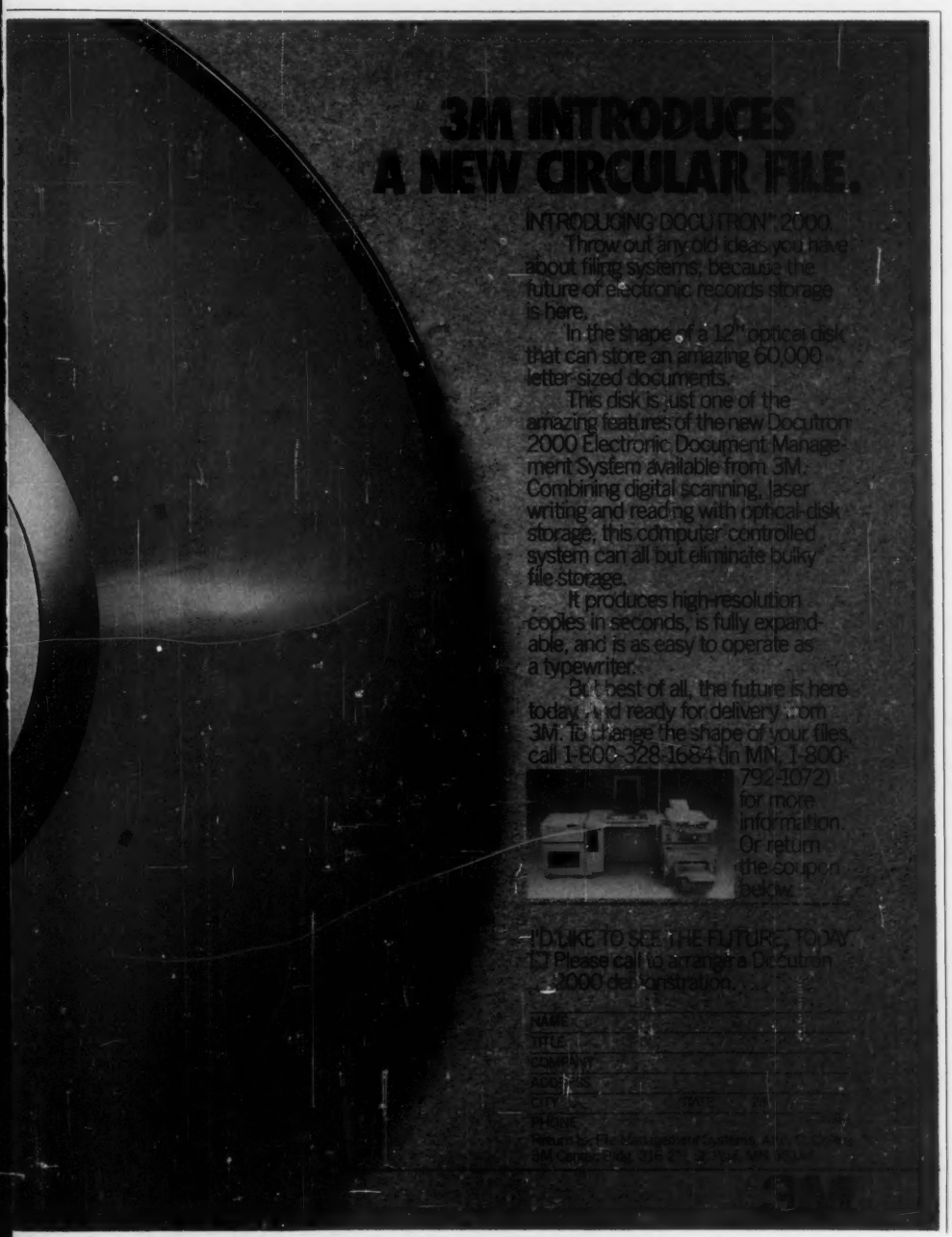
According to Rudolf Strobl, a consultant with Arthur D. Little, Inc. in Cambridge, Mass., bringing a full LU6.2 to the 9370 world is a missing part of the puzzle that has to be announced sometime this year.

"The key issue is to position 9370s as hosts of distributed networks as well as distributed departmental machines," Strobl says.

To accomplish this, a full LU6.2 facility is necessary, he adds.

Guessing at IBM's rationale for announcing the 9370 despite incomplete connectivity features, Strobl says, "The 9370 was put together fast to respond to DEC. IBM didn't take time to put all the connectivity packages together." But, he adds, "The user will get hit with a slew of 9370 connectivity support in 1987 that will make the 9370 a viable product."

S. G.



IBM-Rolm eye CBX-SNA link

Although the consummation of the IBM-Rolm Corp. marriage may eventually be expressed in the integration of the Rolm Computerized Branch Exchange (CBX) with IBM's Systems Network Architecture (SNA), some observers say such a link may be years away. In the meantime, this year will bring a number of stepping stones along the path to that goal.

T. Doane Perry

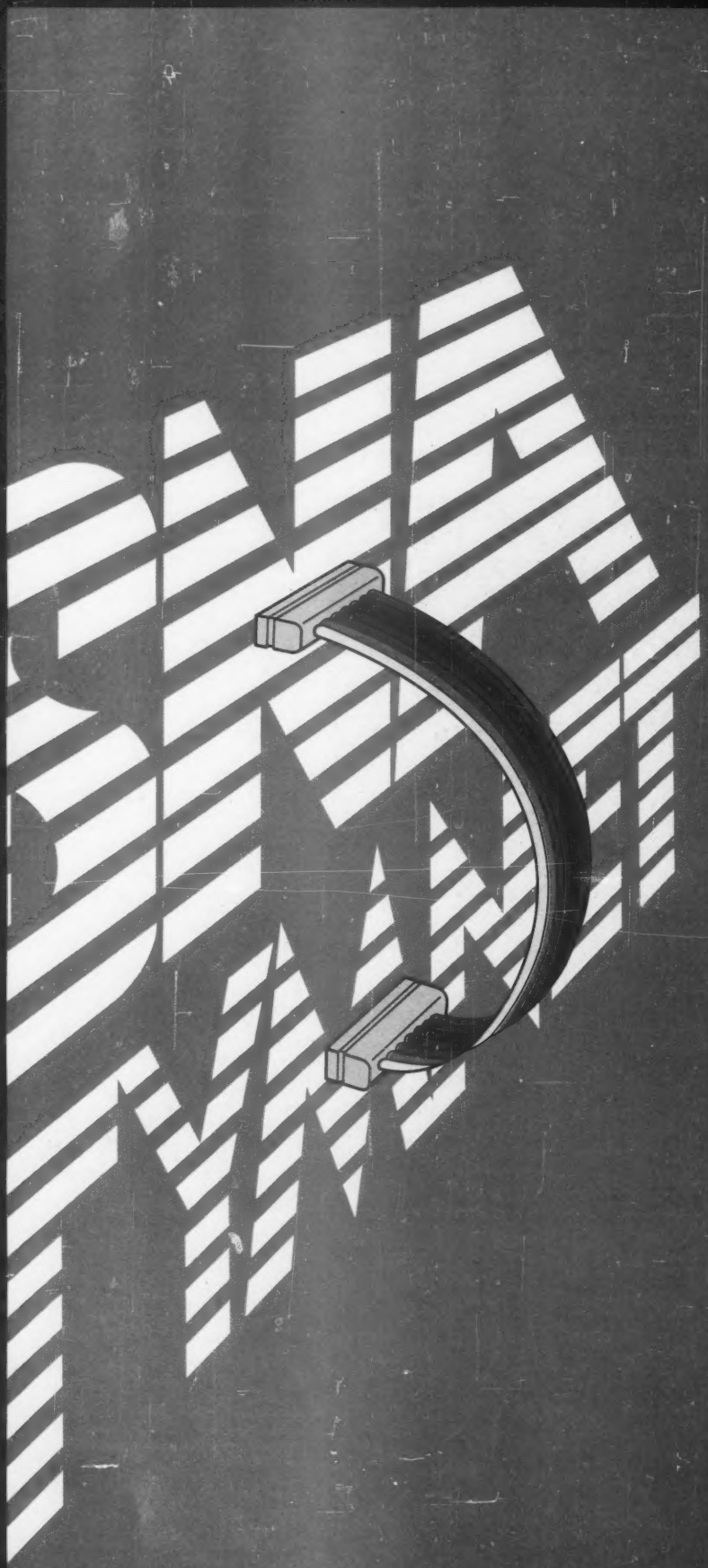
"There will be more Phonemail announcements," says T. Doane Perry, a telecommunications analyst with International Data Corp. in Framingham, Mass., referring to Rolm's voice messaging system. He adds that a Phonemail link to IBM's Distributed Office Support System and Professional Office System is a logical step.

Linking IBM's computer equipment and Rolm's telephone equipment, however, is made difficult by architectural differences.

In addition, Perry says Rolm will need a new CBX eventually and that making it compatible with Integrated Services Digital Network will be a key issue. Frank Dzubeck of Communications Network Architects in Washington, D.C., concurs with Perry's assessment. "I'm looking for a new CBX. It won't be this year, though," he says.

Meanwhile, IBM's fall announcement of its Netview SNA-based network management system was highlighted by interfaces with Rolm's CBXs. IBM will likely build on this connectivity in the coming year.

S. G.



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Microsoft pace gives life to alternatives

Operating systems find niche opportunities

BY JAMES A. MARTIN

Frustrated microcomputer users still await operating system advances that will deliver what the hardware technologies can only promise. Updated Microsoft Corp. MS-DOS and IBM PC-DOS systems are expected for Intel Corp. 80286-based systems in 1987, but in the meantime, other software developers and hardware vendors will be working to gain some ground with alternatives.

Despite disappointments, AT&T still has hope that its Unix multiuser system will catch on in commercial environments, while Apple Computer, Inc. and Atari Corp., among others, are expected to continue beefing up their IBM-incompatible systems efforts in bids to attract corporate America. In addition, MS-DOS enhancement systems from third-party vendors are looking to carve out niches for themselves.

Given the large installed base of MS-DOS-based microcomputers — about seven million — and MS-DOS's status as the operating system standard, there appears to be little chance that any alternative could become widely accepted in the near future. In 1986, for example, 68% of microcomputers sold will run MS-DOS, increasing to 84% by 1990, according to Future Computing, Inc.

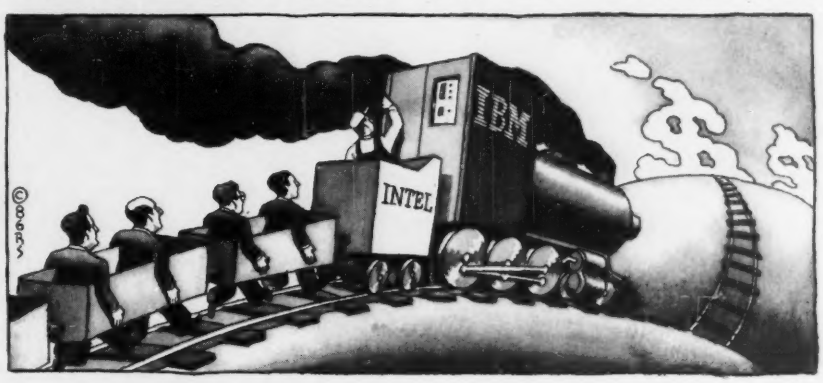
But as the end-user and MIS communities await operating systems for 80286 and Intel 80386-based machines, the aperture is widening for alternatives, even if confined to niche market or also-ran status. "There is enough marketplace confusion to allow competitors to come in with technically superior or innovative systems to seize the moment," according to Tracy Licklider, chairman of Ontio Computer Products Corp. in Cambridge, Mass. "Where there are cleavages in technology between old and new, there is always the opportunity for someone to come in and make themselves known."

AT&T's Unix is seen as one of the main MS-DOS alternatives expected to gain in popularity, most likely as a secondary operating system subordinate to MS-DOS, observers say. Unix has been widely criticized in the past for being too complex for corporate environments, but the emergence of the 386 chip and its multitasking capabilities is expected by some analysts to give Unix a boost.

"Multitasking is going to be a critical application in the future, and with the 386 chip and the 32-bit data bus, you'll soon see Unix coprocessor boards on MS-DOS machines," says John McCarthy, research manager for Forrester Research, Inc. in Cambridge, Mass.

Unix and MS-DOS will begin to converge, with one operating system enhancing the other, according to Bruce Ken Huie, a Unix analyst with International Data Corp. in Framingham, Mass. "Unix was created on minicomputers and has been brought down to micros, while MS-DOS systems are climbing up to be like minicomputers." As a result, Huie adds, there should be a strong imitation of Unix in the next MS-DOS version.

"I don't see a lot of people putting Unix on an IBM PC," says Alan Gross, president of Micro-



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Continued from page 21

computer Managers Association in New York. "But I do think that MS-DOS will be moving toward providing some of the utilities provided now by Unix, and that it'll be more like Unix in the future, say five years from now."

Despite this anticipated merger, MS-DOS will continue to be the most important operating system into the 1990s, according to David Ahl, founder of *Creative Computing Magazine* and author of several books on microcomputers. "But it won't be as widely used as it is today," he adds. "Multiuser environments will become more important than they are now, and there just won't be this incredible dominance by IBM."

Unix faces competition not only from MS-DOS but from Unix derivatives, such as the Microsoft Xenix operating system. In addition, Pick Systems Pick operating system is seen by some as a Unix alternative expected to enjoy increased popularity in the next few years.

"For certain applications, Pick could be a real contender, rivaling Unix and other systems that run on 386 machines," Ahl says. "It's been around longer, and like Unix it's truly transportable over a number of different machines."

What is transportable, however, is not always easy to use. With microcomputers expected to spread through all levels of corporate America, there will be an increasing need for systems offering ease-of-use interfaces, and Unix, Pick and other multiuser systems are considered more complicated than their single-user competitors. On this level, Apple's Macintosh could make some strong inroads, providing it fulfills its promise of becoming a powerful business alternative (see story page 25).

Other alternatives, such as Software Link Inc.'s PC-MOS/386, Digital Research, Inc.'s Concurrent PC-DOS, Microsoft's Windows and IBM's Topview, could also gain in popularity in the next few years.

"There are a number of MS-DOS enhancement systems, but it's all chaotic," Licklider says. "Developers can't rely on those capabilities in their user environments. Also, it's been unclear what will happen to [Microsoft] Windows when the multitasking portion becomes part of the next MS-DOS, and IBM still hasn't announced its plans for a 386 operating system."

Those systems are expected to develop only "small niches," according to Meg Lewis, vice-president of Future Computing in Dallas. "They should develop a dedicated but small band of followers. In the PC market, application developers go after the biggest targets, and that's clearly MS-DOS," Lewis says.

The bottom line is that the micro market is market-driven, while other segments, such as minicomputers, are more technology-driven, Lewis adds. "MS-DOS will change much more slowly than users would like, but it will eventually accommodate their needs, and they'll for the most part be satisfied. Simply increasing the speed of the computers improves their performance, and that makes most users happy.

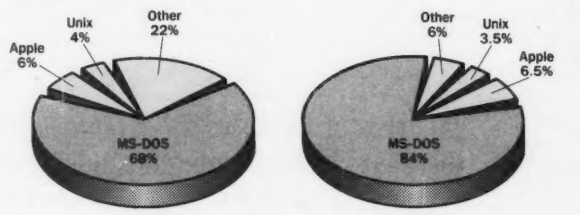
"On the other hand, there'll be an outer edge of users with a need for real power. They'll be attracted to Unix. It's the same with the Macintosh; there will be users who need an easy-to-use system with good graphics, and they'll find the Macintosh attractive."

Despite the fact that MS-DOS will continue to be the standard and will offer some improvements in the year to come, there will always be room for alternatives, Lewis says.

"Market dynamics indicate that MS-DOS will get bigger and better, but that doesn't mean another company can't come in with an alternative and make some money," she says. "They just won't be able to dominate the market."

Operating systems

Business personal computers



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Apple's Mac: The art of successfully filling a niche

Apple Computer, Inc.'s Macintosh microcomputer will probably never rise far above its status as a niche machine, nor become a widely accepted challenger to the Microsoft Corp. MS-DOS standard, most analysts maintain. But, as one user says, "It sure fills some niches very well."

First introduced in 1984 and praised for its ease-of-use features and graphics capabilities, the Mac faced formidable competition as an office machine — IBM Personal Computers and compatibles running MS-DOS had staked out that territory three years earlier.

In January 1986, however, Apple made a bid for the Mac's future in the office with the Mac Plus, which had more memory, an improved keyboard, more floppy disk storage and the capability to be expanded by third-party developers. Further upgrades, including a larger screen, color graphics, additional memory and faster clock speeds, are expected in 1987.

Although improvements have been much delayed, they are a welcome sight to loyal users who feel the Mac still has a fighting chance. "I don't see a thing that MS-DOS has that the Mac won't do in the next year or two," says Gary Cosimini, senior art director of operations and technology for the *New York Times*, where four Mac Pluses are used to design page layouts.

"I don't see the use of MS-DOS equipment in most applications," Cosimini continues. "It's just an operating system that's not a whole lot better than CP/M," the operating system developed by Digital Research, Inc. for 8-bit microcomputers.

The Macintosh is more global in its design. The Mac and its use of Adobe Systems, Inc. Proscript page description language, Appletalk network and Laserwriter printer is more of an integrated system than MS-DOS, Cosimini adds. Most microcomputer applications do not require as much speed as the Intel Corp. 80386 chip offers, he says, and the Macintosh can also be connected to a mainframe computer.

"So there's no real advantage to MS-DOS. You can't beat an IBM PC for saving a long file to a disk, but for people who are not really power users and who routinely perform complicated tasks, the Mac can easily outrun the competition."

At Aerospace Corp. in El Segundo, Calif., the Mac Plus is used as a software development workstation for artificial intelligence applications, a low-cost alternative to engineering workstations from vendors such as Sun Microsystems, Inc. and Symbolics, Inc.

The operating-system standard at Aerospace Corp., however, is MS-DOS, and will continue to be, despite the Mac's popularity in certain applications. "It took too long for Apple to open up the Mac so it could become a real challenge to the MS-DOS standard," says Peter C. Coffee, engineering specialist for Aerospace

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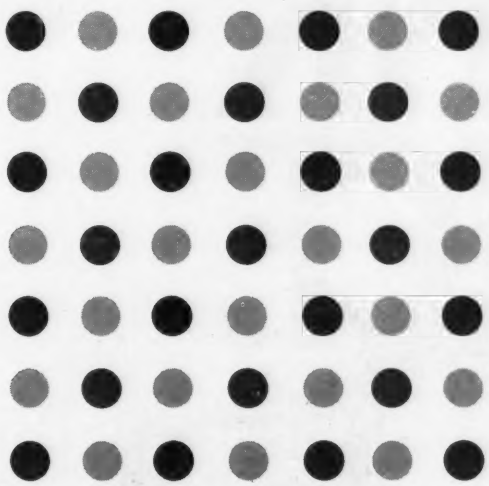

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Continued from previous page

Corp.'s information technology research department. "It left a lot of us very frustrated."

The Macintosh does have an advantage as a uniform architecture, Coffee said. "That's one of the few things Apple succeeded in doing with the Mac, making it a standard machine in hardware and user interfaces. That means there are fewer problems with code being busted when you move up in a machine."

Despite its drawbacks, the Macintosh will continue to gain in popularity but will be relegated to also-ran status in a world dominated by MS-DOS.

Says Coffee: "As long as the rest of the world is MS-DOS and Intel-oriented, then any applications we deliver are going to be targeted toward that environment.

"The Mac is basically a niche machine," he adds, "and I don't see it breaking out from that role. But it sure fills some niches very well, and I'm glad to see it maturing."

"Clearly the Mac has found niches for itself, especially in desktop publishing, and a lot of people find that it's more friendly than MS-DOS and other systems, where the user needs to know a lot of unclear commands," agrees David Ahl, an author of several books on microcomputers. "As a result, more people will be interested in ease-of-use systems in the future."

Before it can become more widely accepted, however, the Macintosh must continue to be upgraded to offer more memory, an open architecture and better connectivity to incompatible systems such as IBM and Unix.

It also must overcome its image with some as a computer for the home and not the office.

"The Mac is basically a device driver for a laser printer," says John McCarthy, research manager for Forrester Research, Inc. in Cambridge, Mass. "If there's a Mac II that does away with slow speeds, a closed box and screen limitations, and if MS-DOS 5.0 doesn't fly and Microsoft stumbles badly, then the Mac could take off. But Microsoft would really have to stumble."

J. A. M.

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FORE-CASTERS

"I'd like to say we're going to see a [software] revolution. The problem is I don't know if people are ready for a revolution," says Michael L. Schneider, vice-president of technology research at Manufacturers Hanover Trust Co. in New York. "Until now, computers in the office have automated what we've done on paper. I think the revolution into office technology is when people allow the technologies to actually perturb, to change the way they operate."

The revolution Schneider speaks of will come "when people permit the technologies to change the way they work," he says. "I think we're going to start to see that within the office in the next five years. Right now, people have factory systems that are not tied to information processing systems, not tied to what I'll call office automation."

He says the industry will begin to see true office automation when the information from the factory flows into the entire corporation, when the manager can get information at his desk with no difference in whether it comes from the mainframe, another site or the factory floor — as simply as getting a memo.

E. G.

Managers seek tools to exploit today's PCs

MS-DOS with more memory, faster software top wish lists

ANTHONY RUSSO ILLUSTRATION

BY DAVID BRIGHT

Despite the incredible advances in personal computing in the past 10 years, today's microcomputer managers are not satisfied. Many indicate that what they need is essentially a fulfillment of the promise represented by the microcomputers already installed at their companies.

The key will be to obtain operating system software and applications "that would take advantage of the hardware that we all have on our desks," notes Michael Perry, vice-president and controller at A. H. Belo Corp., a Dallas-based publishing company.

For several years, scientists and vendors have been predicting that users would someday have the power of a minicomputer or a mainframe available in a desktop personal computer. With powerful new machines like Compaq Computer Corp.'s Deskpro 386 now arriving on the scene, that time has come.

As many managers point out, however, the next challenges include harnessing that power with complementary, easy-to-use software, economically and efficiently tying systems together so as to share resources and making better use of existing technologies.

The one product that the majority of micro managers consider a requirement is a version of Microsoft Corp.'s MS-DOS operating system that offers, first and foremost, the ability to access greater amounts of random-access memory (RAM) and, second, multitasking capability. Another common concern is that even after a new MS-DOS becomes available, it will take software developers a long time to offer applications tailored to the new operating system.

Also topping micro managers' wish lists are a common user interface, improved local-area networking (LAN) and connectivity products and a merging of laptop and desktop computers.

Since IBM introduced its Intel Corp. 80286-based Personal Computer AT system in August 1984, micro managers have been longing for a revamped version of IBM's PC-DOS that would take advantage of the machine's extended capabilities. According to most reports, that operating system will probably not be announced until mid- or late 1987.

Without the new MS-DOS, not even the AT — let alone the new class of Intel 80386-based machines — is being fully utilized. For business purposes, the 640K bytes of RAM currently offered by MS-DOS is "woefully inadequate today and will certainly be worse tomorrow," according to Cheryl Currid, manager of sales, systems, planning and information at Coca-Cola Company Foods Division in Houston. "I'm sure that's holding back software development more than the hardware, because the hardware is there."

The 640K bytes of RAM is such a limitation, Currid says, that some AT users at her company have to reboot their systems between applications because of crowding from RAM-resident software. "There's some utilities out that work in that area, but they don't work well enough," she says.

With software packages getting better but larger, the memory limitation is becoming more of a problem, adds Rich Reed, a senior technical consultant at Cigna Corp.'s Cigna Systems Division in Bloomfield, Conn. "Better memory management. More memory, that's what I want," he stresses. "More real memory. Memory that I can get to, memory that's not only for *this* kind of file or *that* kind of data or *this* kind of application, but memory that I can use for anything. And lots of it. There's packages being written now that are real nice, but they just run out of room. You just can't use them to their full extent."

The extra memory will be particularly useful for data base applications, which cry out for more memory, Reed notes.

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Continued from page 27

He adds that expanded memory boards such as Intel's Aboveboard are nothing but patches until memory limitations are removed.

Hilarius Fuchs, information center director at Continental Grain Co. in New York, is anxious to obtain MS-DOS applications built for the 80286. Since it will naturally take some time for software developers to produce packages under the new MS-DOS, Fuchs warns that the new class of applications could be as much as a year and a half away.

When the new applications arrive, many managers say they would like them to have a common user interface, which would greatly reduce user learning time. Most packages are separate entities that need commonality of keystrokes, says Max Hughes, vice-president of systems communications at Pfizer, Inc. in New York.

Evan Carpenter, who manages personal computers at Litton Systems, Inc.'s Aero Products Division in Moorpark, Calif., agrees that software manufacturers should get together in making their products more compatible. "We have a big problem here with trying to integrate these packages, with getting them to talk in a reasonable language together to move information back and forth. I'm sure everybody has this problem," he says.

Mike Perry

A common user interface would serve the valuable function of "giving a lot of comfort to the end user," adds Cigna Systems' Reed. Toward that end, the division has developed a menu system that it hopes to make standard on Cigna Corp.'s more than 14,000 workstations.

Microsoft's Windows' graphically oriented environment would seem to address the problem, but Reed says it is not the solution right now because it is too slow. He adds that the product may have been ahead of its time and could have a better chance of success with the much more powerful 80386-based systems.

As an enthusiastic Windows user, Carpenter predicts that "with the more powerful machines coming out, Windows is going to become very desirable very, very quickly."

Most non-data-processing end users know only four or five MS-DOS commands — "just enough to get them through," notes Fred Zickert, manager of the PC support center at Eaton Corp. in Cleveland. But greater availability of utilities such as those found in Peter Norton Computing's Commander package would help those users make better use of the operating system, he says. The utilities handle such functions as creating directories, copying programs and deleting files.

To make applications software faster, vendors should include in their programs the ability to take over the keyboard's type-ahead buffer, Zickert says, because the cursor movement in some programs is "so doggone slow." To help alleviate that problem, Zickert uses a package from Revolution Software called Cruise Control, which he says helps save time on many programs, including word processing and spreadsheet packages. "The vendors just have not taken control of that buffer," he says.

'We have a big problem here with trying to integrate these packages, with getting them to talk in a reasonable language together to move information back and forth.'

EVAN CARPENTER
Litton Systems, Inc.

While many of the micro managers' gripes focus on software products, Kevin Dopp, of St. Louis-based footwear and apparel manufacturer Brown Group, Inc., wants to see improvement in laptop computers. "I'd like to see the technology merged between the desktop computer and the laptop computer," he says.

There are some good laptop systems currently on the market, he adds, but in terms of capabilities, they haven't attained the performance offered in some desktop systems. "Why couldn't the same 7- or 12-pound unit that I carry around sit on my desk and have the same kind of capabilities? It wouldn't upset me a lot if I had to plug an external monitor into it," he says.

Cheryl Currid

But regardless of the limits of the available hardware and software technology, there are steps that vendors can immediately take to make microcomputing a more pleasant and efficient experience. Echoing the wishes of many managers and end users, Pfizer's Hughes says he wants to see "manuals written in English, not by illiterate nerds."

Improve PC links, managers say

The common complaints from microcomputer managers focus on operating systems and application programs, but many managers are also looking for standardization and ease of use in products that link micros together and to minis and mainframes.

"Our biggest problem here has to do with connectability," says Evan Carpenter at Litton Systems, Inc. "We can connect with virtually anything, but it's a real pain in the neck to do it. There's half a dozen different ways to do it, and none of them do it the same way."

As the American Heart Association in Columbus, Ohio, gets more involved in file transfer, improved connectability products would help a great deal, says MIS director Cedrick Douglas.

"I wish I could get a better board for file transfer [between personal computers and IBM System/36s and between micros and mainframes]," he says.

Douglas would particularly like to see the hardware and software installation process simplified so as not to require any special expertise on the part of the end user.

"When I acquired an AST 5000 Plus series board and hooked it to a System/36, it was easy for me, but when I was trying to go through it with the accounting department, they said, 'Huh?' " he adds.

To improve local-area networks (LAN), software vendors should make their packages "more LAN-aware," says Cheryl Currid at Coca-Cola Company Foods Division. "Having had a local-area network for a year now, I see that this is the way to go. There's a lot of things you can do [on a LAN] other than just sharing printers and other devices. There's a tremendous capability for data sharing and building departmental-type applications. I don't think local-area networks are being used that way as much, but I think they will in the future," she adds.

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開拓者 Means pioneer

HP battles doubts about systems, marketing skills

Haunted by delays, corroded competitive edge

BY JEFFRY BEELER

Two criticisms that Hewlett-Packard Co. has, with only limited success, battled for years will continue to influence powerfully the course and content of the firm's management strategy and product development efforts.

In 1987, HP will again pour considerable resources into its ongoing campaign to counter skepticism about the viability of its business systems line and the effectiveness of its marketing practices.

On the business systems front, the firm will undoubtedly go to great lengths to try to meet the revised shipment deadlines for its troubled HP 3000 Model 930.

"They need very badly to get that machine out on the market as soon as they can in the best possible shape," says Darlene Litcher, MIS chief for the Oakland, Calif., office of the U.S. Department of Energy. "For more than a year, they've experienced one glitch after another with the product, and they can ill afford to have any more.

"If they continue to have problems with the 930," Litcher warns, "they're going to be hurt seriously."

Luckily for the company, the I/O software problems that have dealt the 930 its latest setback apparently lend themselves fairly readily to a solution. "I think HP will fix the trouble and deliver the system on time," says Patricia Seybold, head of the Seybold Office Computing Group, Inc. "In fact, they may even start shipping the product sooner than they publicly said they would."

Barring a repetition of the snag that recently forced HP to announce a six-month delay in delivering the 930, the credibility of the processor's much-discussed Precision Architecture will remain largely intact. "After waiting patiently for a product that is already two years late, most customers are unlikely to be too concerned about another six months," says Craig Symons, a vice-president at Gartner Group, Inc.

Of much greater concern to HP users than deferred availability is the question of whether the 930's performance will meet buyer expectations, Symons says.

In launching the Spectrum development project that made Precision Architecture possible, HP sought to do far more than just match its rivals and counter criticism of its failure to announce a 32-bit business system. Above all, the vendor counted on Spectrum to produce a "quantum leap" in technology and enable it to "leapfrog the competition," according to Symons' associate, Gartner Group senior analyst Joseph McGrath.

But by repeatedly postponing the 930's first shipments, HP has undercut somewhat its own technological aspirations. "By the time they finally ship, their competitors will have had an awful long time to improve their own products and price/performance in response," McGrath says. "Spectrum will be an improvement, but it won't be the quantum leap they were hoping for."

RISC architecture

HP's decade-long effort

1981
Researchers from various Hewlett-Packard Co. divisions, including HP Laboratories, conduct research to measure precisely the internal performance characteristics of processors using conventional von Neumann architecture. Results of the research highlight the inefficiencies of traditional CPU designs and soon persuade HP to build its next-generation systems around a highly unconventional architecture that includes a reduced instruction set.

JANUARY 1984
HP announces an unspecified technology breakthrough that has prompted the company to redirect an ongoing effort to extend its 3000 series commercial systems.

JUNE 1984
HP publicly associates its secret breakthrough technology with reduced instruction set computing (RISC).

MAY 1985
HP reveals that 100 prototypes of its unannounced RISC processors are undergoing alpha tests inside company facilities.

FEB. 25, 1986
After nearly five years of research and development, HP formally announces the 3000 Models 930 and 950, two business systems that mark the first use of the company's Precision Architecture.

MAY 28, 1986
With the introduction of its 9000 Model 840, HP for the first time extends Precision Architecture to the technical side of its processor family.

SEPT. 25, 1986
HP stuns much of the industry with its announcement that first shipments of the Model 930, originally set for availability during the fourth quarter of this year, will be delayed.

NOV. 20, 1986
Customer deliveries of the Model 840 begin on schedule.

MID-1987
Revised target date for first shipments of the Model 930. Unless HP's delivery timetable slips again, the Model 950 will also become available at the same time, as originally expected.

CW Chart

Continued from page 30

Another factor that may dim HP's prospects for unchallenged superiority in superminis is Precision Architecture's inherent technological limitations. "Some systems elements like memory management, floating point and I/O gain no advantages at all from the new architecture," Symons says. "So when you integrate all the various pieces in a system, the design gets diluted and provides less performance than its developers expected."

The erosion of some of Precision Architecture's predicted edge will probably matter little to most of the companies that use HP equipment for office automation — and with good reason. Most of these customers rely far more heavily on the low end of the HP 3000 line than on its high-end, where the 930 sits, according to Lee Doyle, a senior analyst at International Data Corp.

So despite Precision Architecture's diminished appeal, HP's customer base is expected to remain relatively loyal — at least in the OA part of its 3000 series business. "HP will still have to commit a lot more blunders before users will be forced to migrate in large numbers to other vendors," Doyle says.

But among other classes of customers, especially those that require high capacity for applications such as manufacturing, the loss of some of Precision Architecture's technological luster may take its toll. "Users who already have applications running on HP products will likely move the software to the 930 to take advantage of its increased performance," Symons says.

"But when they buy or develop new applications, many of those same users will no longer consider HP as a supplier. They'll look elsewhere for their processors."

As for its purported deficiencies as a product marketer, no one is more acutely conscious of the firm's urgent need to improve than HP itself. This year, the company will move into full-scale implementation of an ambitious plan to increase the productivity and effectiveness of its direct sales force through the use of high technology.

"By mid-1987, all our field reps will be equipped with our own portable computers and will be participating in our sales productivity network," says Bill Murphy, marketing manager for HP's business systems sector.

At the same time, the vendor also plans to intensify its relationship with value-added business partners and thus expand its presence in narrow, specialized markets such as financial services, manufacturing, law, sales and distribution, Murphy adds.

How well HP addresses the perceived weaknesses in both its marketing skills and business systems family will determine in large measure whether the reverses the company suffered in 1986 will return to haunt it in 1987.

For the largest electronics vendor headquartered in Silicon Valley, the past year has offered a decidedly mixed bag of results. On the negative side, HP shocked the industry last September when it announced a six-month delay in shipments of the 930, the first business-oriented product of its Spectrum development project.

Like IBM and most other hardware suppliers, the Palo Alto, Calif.-based firm has also taken its fair share of lumps financially. During the fiscal year that ended on Oct. 31, the high-tech giant's revenue and earnings rose just 9% and 5% respectively — a paltry increase by HP standards.

The firm's lackluster performance in turn prompted HP earlier this year to take some highly uncharacteristic steps to cut its personnel costs. Through a combination of early-retirement incentives and voluntary severance programs, the company trimmed 1,515 employees from its work force but stopped short of abandoning its long-standing policy of no layoffs.

On the positive side, HP in 1986 preserved its high rank in desktop publishing and greatly strengthened its hand in office automation through a raft of software announcements that enhanced the company's networking and systems integration capabilities. During the past 12 months, the firm also solidified its position in the technical computing sector by introducing the HP 9000 Model 840, an engineering system that embodies the same Precision Architecture as the 930.

But although HP remains fundamentally sound and is well positioned in its target markets, the company has found itself unable to shake entirely two of its most persistent bad raps. One is the popular belief that HP, especially in the office systems arena, lacks the marketing prowess of leading competitors such as IBM and Digital Equipment Corp.

"HP isn't really known as a true marketing company," says Ray Pawlicki, assistant vice-president of Citicorp.'s asset-based Finance Division, which uses four HP 3000 Model 70s. "They're not great at coming in and giving you flashy brochures about how great things are going to be."

Continued on next page

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Continued from page 31

The other perennial knock against HP is that the 3000, its flagship product line in the commercial systems field, is technologically over the hill because of its 16-bit architecture.

Typical of the HP 3000's numerous detractors are some of the senior executives to whom Litcher reports at the Department of Energy installation in Oakland.

"In the opinion of our upper management, the 3000 line may be architecturally outdated," she says.

Litcher strongly disagrees with her bosses' assessment and with their further suspicion that HP may be unable to compete with 32-bit systems vendors like DEC.

"Everything works, and our downtime is less than 1%," she says. "We're spoiled and couldn't be happier without going up to a $1 million mainframe."

To a large extent, the nagging criticisms of HP's marketing efforts and business systems technology are a problem of perception rather than an accurate reflection of reality.

Although the firm may lack some of IBM's marketing glitz and pizzazz, "It does a good job of listening to users and finding out what their needs are," Pawlicki says.

"If you talk to individual customers, they'll defend HP to the hilt for just that reason."

HP's rapport with its installed base results partly from its recent adoption of a strategy that it calls "imaginative understanding of user needs," HP's Murphy says.

Among the strategy's manifestations is an HP-devised process known as Total Quality Control/Office, in which company representatives visit customer sites and analyze their work habits with an eye toward boosting their productivity.

Yet for all its vigorous efforts and noble intentions, HP is often still perceived as a Johnny-come-lately to office automation.

"Because offices are fairly new turf for them, they don't seem as willing as DEC to really dig into a customer's specific business requirements," Seybold says.

FORECASTERS

Earl Joseph, president of Anticipatory Sciences in Minneapolis, sees a big jump in information technology coming about between 1988 and 1991 to 1992, but first there must be an intermediate step, with today's technology made more cost-effective. This will require a step up in the level of integration for hardware and software.

He says that in order to be cost-competitive for that next wave, vendors will have to increase the cost/performance of their products by at least a factor of 10.

"At the present time, they're integrating the software still at the systems support level, with the typical automation type applications. I think we're going to see the next step of integration, where we'll get the more specialized applications with that system support software," he says.

Expert systems will play a larger part in corporate life, perhaps sooner than most expect, he thinks. The year 1987 is when "we'll be beginning to replace professional people at a pretty fast clip, killing the professional with expert systems," he says. The year "1988 should be when it really hits."

He says high-level experts might be the first to go, because expert systems will allow lower-level personnel to match the high-level expert and be paid less for it. "Why should you pay for it on your staff when you can just hire the experts back on a part-time basis when you need them?" he asks.

"It's going to especially hit middle management. We're already beginning to see that," he says. The increase in communications will hasten the arrival of distributed systems, which will further break down the central office, where there usually is the greatest overload of high-paid staff, he says. "I think that's where you're going be hitting them first — in the central office.

"I think from what I can gather, most of the professionals out there are underestimating the effects of the expert systems. They think it's going to be an evolutionary type of thing. I think that once expert systems crash the threshold of being useful, it's going to change, almost overnight, the mix of people. I don't think it's something that comes on slowly, and I don't see enough people preparing for that."

Some of this displacement also will hit the computer professionals, he says — "the chief information officer's staff and the MIS people, the middle types of staff."

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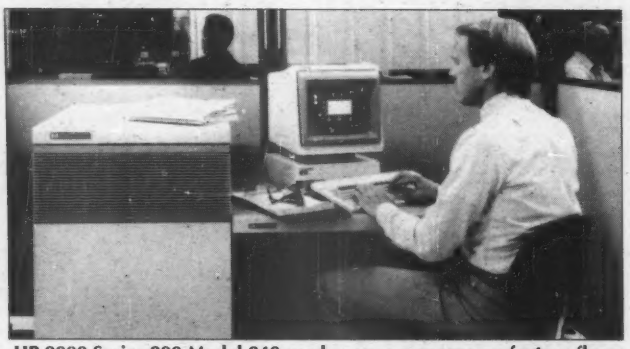

HP 9000 Series 800 Model 840 used as area manager on factory floor

HP on the offensive with plan to outrun current pacesetters

Hewlett-Packard Co., which encountered intense competition and technological ferment almost everywhere in its diverse product line in 1986, can expect a lot more of the same during the next 12 months.

In fields ranging from technical computing and desktop publishing to factory automation and office systems, HP is reportedly readying a flurry of upcoming product announcements aimed either at repelling aggressive market challengers or attacking current industry pacesetters.

In the technical workstation arena, users can expect the firm to make its first tentative forays this year into market niches where it has traditionally lacked a substantial presence.

HP launches assault

In particular, HP will mount its first limited assault against the likes of Sun Microsystems, Inc. and Apollo Computer, Inc., according to International Data Corp. (IDC) consultant Vicki Brown.

To date, most of the company's 9000 series technical workstations have gone to the same class of customers who have historically bought large volumes of the vendor's test and measurement gear. Among such users, HP enjoys "an incredibly loyal following that seldom even considers an alternative supplier," Brown says.

But as soon as HP ventures outside its traditional installed base, the firm's name recognition and market status shrink to near zero. "Most of the people who obtain their technical workstations from outfits like Sun or Apollo rarely even mention HP's name," much less seriously consider it for a major acquisition, Brown says.

This year, though, the company will expand its efforts to heighten its visibility in the Sun and Apollo domains. One way of doing so might be for HP to introduce the first Precision Architecture version of its HP 9000 Model 300 workstation family, Brown says.

In its graphics and desktop publishing endeavors, meanwhile, HP will face growing competitive pressures on its already "tenuous" market leadership, according to Alan Paller, president of AUI Data Graphics, Inc.

At a time when most other players in the desktop publishing field have standardized on Adobe Systems, Inc.'s Postscript as their document description language (DDL), the Palo Alto, Calif.-based electronics giant has opted instead for Imagen Corp.'s DDL.

So, how well HP's desktop publishing system fares this year hinges chiefly on whether leading microcomputer software developers equip their products with Imagen DDL drivers, Paller says.

If, as expected, the software companies do support the necessary drivers, HP's short-term future in desktop publishing looks reasonably bright. But if the same vendors decide to do otherwise, many users of the company's laser printers may be forced to switch to rival systems to gain the benefit of Postscript availability, Paller adds.

As for the office systems sector, HP will likely announce support this year for both IBM's Systems Network Architecture Distribution Services and for the X.400 standard,

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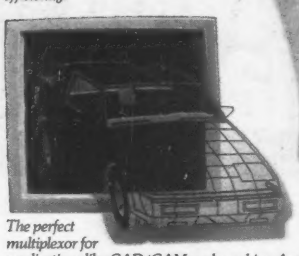

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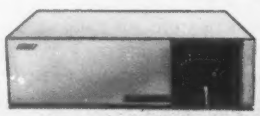

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according to Gartner Group, Inc. senior analyst Joseph McGrath. If the predicted move comes to pass, the firm will substantially enlarge its peer-to-peer networking capabilities and will maintain technological parity with Data General Corp. and Digital Equipment Corp., two firms which recently announced similar advances.

Long-awaited link

Also predicted to take place early this year is the long-awaited delivery of a software link between HP Access and Cullinet Software, Inc.'s Information Center Management System (ICMS). Introduction of the link will provide HP 3000 series users with transparent access to every IBM data base covered under ICMS, according to Royce Murphy, product line manager with HP's Office Systems Division.

In the factory automation market, meanwhile, HP may this year find itself unable to resist the temptation to announce the first 1000 series system that takes advantage of the firm's Precision Architecture.

The addition of such a machine would complete the unification of HP's three major processor lines under a common technology and "would look extremely elegant from a marketing standpoint," says IDC Vice-President Ralph Finos.

J. B.

FORE-CASTERS

Francis McDonough, deputy commissioner for federal information resources management in the Information Resources Management Service for the U.S. General Services Administration, has policy-setting responsibility and authorization for the whole business of the federal government. McDonough looks for big changes to occur as a result of coming changes in information technology, especially in the area of restructuring work. He says he sees the current level of technology reaching a plateau between now and 1990.

"In the government, we're building a base now, a foundation for the 1990s, so when the technology gets better, the government work force will be in a position to capitalize on it rapidly."

McDonough sees the necessity of better software, particularly easier-to-use versions of microcomputer data base products. "Data base software is just for techies now. It's too hard to use."

He does not subscribe to the hype surrounding the implementation of ubiquitous local-area networks. "We hear theories that everybody needs to talk to everybody, but that's not true," he says. "Why should a customs agent at an airport talk to people who print dollar bills or to budget analysts?" Instead, he says, electronic "tribes" of users will evolve, communities of users with common interests and communications needs.

In the meantime, as he awaits the improved software he expects during the next few years, McDonough plans to implement some clustering and get more experience with networking, establish data access rules for the networks and focus on aggregating purchase requirements and making large buys at big discounts.

In light of coming changes, it is premature to develop sweeping product standards, he says. "These are still the very early days now, so it's ridiculous trying to make decisions as if this were a mature industry."

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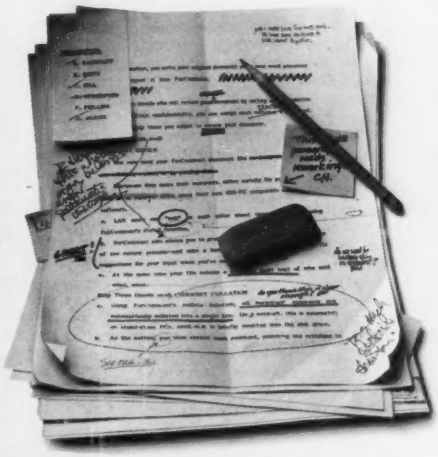

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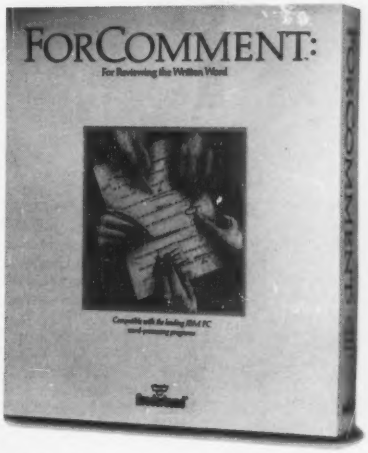

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Generic minis create market competition

Software, services may tip the balance

BY DONNA RAIMONDI

Plain-vanilla minicomputers, while not yet a mass market product, promise to triple in installed base by 1990.

Unix-based boxes built with off-the-shelf microprocessors — the most common types of plain-vanilla systems — account for 10% of the medium-scale systems market, says Bruce Kin Huie, senior industry analyst for Unix markets at International Data Corp (IDC). By 1990, they will corner 17% of that market, defined by IDC as 17- to 128-user minicomputers.

The advantages of generic minis to the MIS manager are clear, at least theoretically. Software that runs on a standardized Unix, Motorola, Inc. 68000-based machine, for example, should run on any other Unix/Motorola CPU, so it would not matter whose boxes customers mix and match. Off-the-shelf parts are cheap and easy to replace; the boxes can be produced inexpensively and cost the buyer less than proprietary systems. Unix, especially, and Pick Systems' Pick, to a lesser degree, are growing standards that have prompted OEMs and value-added resellers (VAR) to produce vertical market software. Upgrading systems should prompt little or no software recoding.

However, this theory does not yet hold up in practice. "When you get into the area of software availability and maintenance and service, it can make a difference who the system comes from," warns Brian Daly, senior associate editor at Datapro Research Corp., reporting on minicomputers.

Large companies with proprietary minicomputers — like Digital Equipment Corp., Data General Corp. or IBM — can provide the communications, software, support systems and upgrade paths users need, while small generic mini manufacturers often cannot.

Buyers must be more careful in choosing hardware and software vendors. "We stay with McDonnell Douglas [Corp.] for our Pick-based systems because of its name and the service, and we know they won't be here today, gone tomorrow," says Sue Reinstein, senior programmer/analyst at Kirk Paper Co. in City of Commerce, Calif.

"Other companies that get on the Pick and off-the-shelf processor systems bandwagon might give us a better deal initially, but if they are gone tomorrow, what good is it?," she asks.

Unix, while becoming a standard because of AT&T's System V interface definition document, which describes the standard way it is supposed to operate, still comes in many flavors, not all of which are easily portable. The price savings of buying a generic box with off-the-shelf parts is only a savings if the buyer can see how it will fill future needs.

"Ask yourself where you are going to be five years down the road and whether you are going to be able to grow that system smoothly without having to go to a lot of sources and without creating a lot of headaches for yourself," Daly advises MIS managers.

Although Unix proponents have predicted bountiful supplies of application software, that promise has not been fulfilled. Many Unix generic box

ANTHONY RUSSO ILLUSTRATION

Continued from page 36

vendors sell primarily through OEMs and VARs, expecting them to develop vertical applications, Daly says.

Application software has grown by 100% during the past year, according to IDC's Huie, but the base it grew on was very small to start with. There are between 2,000 and 2,500 packages out there now, and many small VARs and OEMs are writing for Unix, he says. This growth is prompted by government insistence on the Unix standard and hardware vendors who have latched onto Unix as a cheap way to develop their niche products such as fault-tolerant or transaction-processing machines.

While Unix grows rapidly, it still has not penetrated day-to-day business environments, says Steven Young, senior consultant at New York's Pencom Systems, Inc. At the placement firm, Young finds jobs for Unix programmers nationwide. In the financial services, for example, Unix is used by research experts for financial analyses, but not for business functions like payroll or general ledger, he says.

Application software will increasingly be the driving force in systems choice, especially once distributed data base management systems take hold by the late 1980s, says John McCarthy, research manager of Forrester Research, Inc. in Cambridge, Mass. Software developers for the mini and supermini marketplace will boil down support to three operating systems — IBM's VM, DEC's VMS and maybe Unix, he predicts.

Native Unix

If Unix becomes the standard operating system, traditional minicomputer vendors will have to reduce the price of their boxes and offer Unix if they are to keep customers, Huie says.

Most traditional minicomputer makers already offer Unix as either a native environment or one that runs under the proprietary operating system.

"Those companies are losing business when they don't offer native Unix already because of government and university insistence on it," Huie contends.

Unix is not easy to use in its original form. Companies that sell Unix boxes must first develop interfaces to protect users from the operating system's arcane command structure, says Bernie Buesker, manager of technical support at Texas Instruments, Inc.'s data systems group. In order to promote Unix as the operating system on which TI's newer minicomputers are based, TI has had to build an unintimidating "business interface," as well as functions and facilities that are easier to use than Unix's own.

At the same time, to remain consistent with AT&T's definitions, the vendor has to offer the operating system's own, somewhat difficult-to-use, functions such as the vi editor, leaving the user to choose the functions he wants to use.

"We also believe Unix was deficient in data integrity for the commercial world," Buesker adds. In standard Unix, data is written into the memory, and if Unix has a need for that buffer space, it will then write the data out to disk. TI had to eliminate that problem before Unix could be valuable to its commercial customers, he says.

Unix is not easy to use in its original form. Companies that sell Unix boxes must first develop interfaces to protect users from the operating system's arcane command structure.

Despite all the drawbacks, generic systems are becoming a reality. While Unix-based systems show the most promise as a standard, according to analysts, some vendors supply Pick Systems' Pick operating system. McDonnell Douglas Computer Systems Co., The Ultimate Corp., Applied Digital Data Systems, Inc. and General Automation, Inc. are four of the largest vendors to offer multiuser Pick systems, says Pick analyst Chandru Murthi of Opsys, Inc. in San Francisco. But a growing number of smaller companies and at least two multimillion dollar Japanese vendors — Fujitsu Ltd. and C.I.E. Systems, Inc. — are trying to get a piece of the U.S. market, he adds. While Pick is growing slowly in the U.S. — with close to 70,000 installed systems (all sizes except microcomputers), 430,000-plus users and a growth rate now of 10% per year — it accounts for 10% of all computer systems in Australia and is heavily used in Europe, Murthi says.

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Super microprocessor upheaval nears

A new generation of general-purpose microprocessor-based computers offering price/peformance advantages 10 times greater than currently popular mini- and superminicomputers will hit the market in force during 1987.

The systems will dramatically decrease the price for capabilities measured in million instructions per second (MIPS) and create chaos in distribution and support services, according to a report issued by William Welty of the investment firm Hambrecht & Quist, Inc. Borne of user demand for standardized hardware and software and powerful innovations like the Intel Corp. 80386 microprocessor, the machines will feature bus-oriented architectures loaded with board slots, the report says. This architecture allows the growth of a coprocessor industry that lets users build their own application-specific machines.

The prices of 80386-based systems will be much lower than those charged by traditional minicomputer manufacturers for similar throughput. A Digital Equipment Corp. 4-MIPS machine, CPU only, can cost $60,000 per MIPS, while an 80386-based 4-MIPS system with similar throughput will cost approximately $5,000 per MIPS.

More importantly, the architectural gap between mini- and microprocessor-based systems is closing. The relatively slow speed, moderate instruction set, small main memory and unsophisticated operating system of the microprocessor-based system compared with the mini has been banished by innovations such as 32-bit microprocessors, dynamic random-access memory chips, I/O processors and standardized software like Unix.

"The VAX killer has arrived," says the report in reference to DEC's popular VAX system, based on a proprietary architecture and operating system.

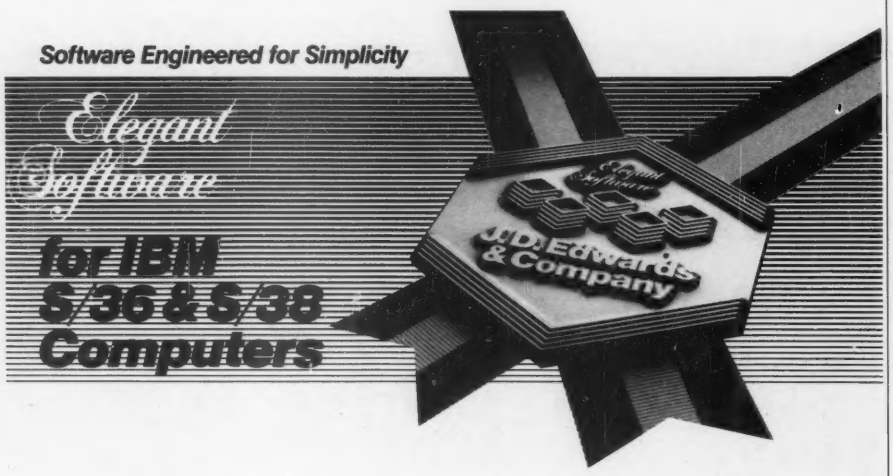
The 80386 chip promises to end the shortcomings of the Intel 8088 microprocessor, on which the IBM Personal Computer was based. In addition to overcoming the lack of resource sharing among processors, 8-bit data paths, no virtual memory, limited memory address, few data types, embryonic pipelining and low bandwidth buses, the 80386 will also equal the performance specifications of many superminis.

Numerous systems manufacturers will introduce 80386-based multiuser systems with cache memory in 1987. All of these systems will run a combination of Unix and Microsoft Corp.'s MS-DOS. This will allow the $6 billion MS-DOS software base to run under Unix. Because the 80386 allows this, there will be a shift in marketshare. Motorola, Inc. chips — currently 80% of the 32-bit microprocessor market — are projected to slip to about 25% of the market. Intel will rise to 50% of the market when the 80386 production ramps up.

At present, users see clear advantages to sticking with proprietary systems such as the VAX. DEC has a huge installed base of applications software that ties its customers to the company. But increasingly, the report says, users will not stand for overpriced MIPS when they have a clear alternative.

The big winners in the $5,000-per-MIPS world are users of computer power. The big losers: vendors that sell $60,000-per-MIPS machines. But $5,000-per-MIPS machines do not support nearly as many people as a $60,000-per-MIPS machine, the report warns. Change is coming, both in distribution channels and support. Value-added reseller franchises could burgeon, value-added distributors will be courted because of their closeness to customers and interconnectivity and interoperability companies will be seen as adding real value. But customers worried about reliability or support may have to face buying two of the systems to keep one going.

D. R.



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TRENDSETTERS

Seven years ago, Walter Z. Bzdok oversaw K Mart Corp.'s pioneering step into distributed processing. Today, he is helping usher the corporation into space-age communications by equipping a continent of K Mart stores with advanced data and video networks.

The $50 million-plus project of linking 2,100 nodes around the country is second only in scope to K Mart's installation of more than 1,500 IBM Series/1 systems from 1979 to 1983, Bzdok says. He was director of DP/MIS at the time.

"We were into this before the industry as a whole claimed the term distributed processing," Bzdok says.

Now, as director of corporate communications and systems reliability, he heads the telecommunications upgrade project. The hub is an 11-meter satellite dish at corporate headquarters in Troy, Mich., communicating with the GTE Corp. G-Star 2 satellite. Each K Mart store, distribution center and regional office will have its own 1.8-meter satellite dish.

The project is intended to reduce the number of dataphone connections per store, Bzdok says.

Most K Mart communications are now on a dial-up basis. Callers retrieve data from point-of-sale controllers, dial from Series/1 systems that run accounting or call from pharmacy microcomputers.

K Mart originally opted for an X.25 packet network because the network would link the varying protocols on the different systems, but the firm had not specifically considered a satellite connection.

Prices of some early satellite solutions were so attractive, however, that the MIS department reopened bids. A combined proposal by GTE Spacenet and GTE Telenet Communications Corp. was the winner.

Savings could be as much as $100 million during a 10-year period — greater than a terrestrial system, according to Bzdok's management proposal.

The hub satellite dish is under construction now. The packet switching gear is installed, and K Mart has begun internal testing.

In March, a Detroit store will become the first to be hooked into the network, with 49 more sites in two states following shortly.

Bzdok expects to finish the pilot by summer.

P. W.

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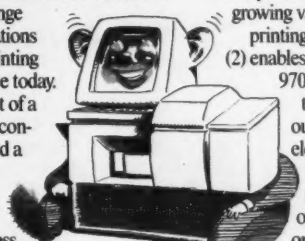

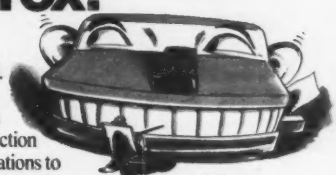

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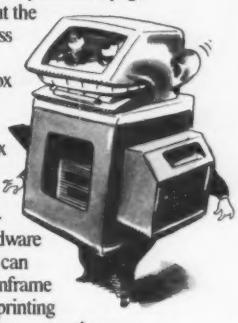

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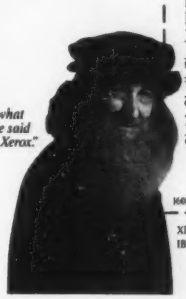

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TRENDSETTERS

Common concerns provided the incentive for the formation of the Personal Computer Professionals Association (PCPA) in Southern California, and the emerging result is influence beyond its members' individual voices, with benefits for both vendors and users.

Central to the effort is Joel Isaacson, technical systems consultant for Carter Hawley Hale Information Services in Anaheim, Calif., who is serving his third year as president of the 75-member organization. The group's monthly meetings include forums on site licensing, training, standardization and upgrades.

"It appeared to many of us that vendors seemed to be directing their efforts toward the individual user, and acting in response to those requirements," Isaacson says of his inspiration in organizing PCPA. "Our role is not to be an antagonist, but perhaps a catalyst, a partner. We like their products, and we want the vendors to recognize our needs."

Even with vendors who did recognize corporate buyers, the members found they had more influence as a roomful of like-minded managers.

"Often, unless you're a corporation with massive numbers of machines, you don't feel like a big deal to vendors," Isaacson says. "If you're General Motors and buying 50,000 copies, that's another story. But we're not all GM."

Among the most successful forums were those with Multimate International Corp., before its acquisition by Ashton-Tate, Isaacson says. "We had the opportunity to provide some good feedback," he says. "They responded as we hoped a vendor would respond. They redirected some of their services for corporate users."

The PCPA also took aim at Ashton-Tate's upgrade policy when Dbase III was announced, Isaacson says. "From what we understand, they did make some changes," such as not requiring return of all disks, he says.

The quintessential corporate vendor, IBM, is in the spotlight at the closing PCPA meeting each year.

"We have them come and present some of their thoughts and ideas, talk about directions as much as possible, give information on services and give us a chance to give feedback," Isaacson says.

"I don't know that we can point to anything that prompted them to change their directions, but I think we've seen IBM come up with some new support opportunities" that members wanted, he adds.

The reception from vendors has been "almost always positive. They're often surprised they haven't heard of us. But any time they can get 30 or 40 corporations in one room and talk about our concerns and why their products have not been received, they take the opportunity," Issacson says.

Isaacson says he also wants PCPA "to provide the kind of intercompany information that will help us all to learn and improve our own operations and become better professionals."

At Carter Hawley Hale, Isaacson provides guidelines and standards for microcomputer installations, which now number more than 450.

"The PCPA has mostly helped me in that I've been able to obtain contacts that are more direct, and therefore clearer, and able to define and understand where things are going," he says.

P. W.

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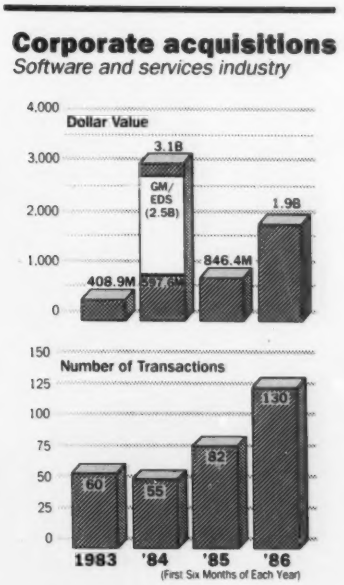
Marriages of strategy and economy

Merger mania should keep the industry volatile into '87



Information provided by Broadview Associates

BY CLINTON WILDER

From their experiences in 1986, users of Sperry Corp. and Honeywell, Inc. products know better than anyone that the computer industry is a highly volatile one. With the industry experiencing both a rapid maturing and a slowing of the heady growth rates of the early 1980s, even the largest vendors are ripe for consolidation.

By most industry tracking indexes, the pace of mergers and acquisitions reached record levels in 1986. The general industry conditions that have sparked such activity are expected to prevail throughout this year, indicating that the industry's merger mania will continue unabated in 1987.

Although the impact of federal tax reform will probably dampen deal-making early in the year, most industry watchers feel the overall upward trend will continue. More and more computer users will find their hardware and software products being marketed by different parent companies than the vendors with which they began the year.

Although the software and services industry does not usually generate the billion-dollar numbers of a Burroughs Corp.-Sperry acquisition, its structure continues to be dominated by buyouts and sell-offs. The industry ranked fourth out of 50 in the volume of mergers and acquisitions between 1981 and 1985, according to W. T. Grimm & Co., a Chicago research firm that tracks merger and acquisition activity. Computer hardware, by contrast, ranked 21st in the same time period.

In mainframe software, virtually every leading vendor has acquired smaller software companies, and two — McCormack & Dodge Corp. and Applied Data Research, Inc. — have been acquired by companies previously outside the computer business.

Several of the largest mainframe software developers, including Computer Associates International, Inc., Management Science America, Inc. (MSA), Uccel Corp., Sterling Software, Inc. and Pansophic Systems, Inc., have made it clear that they intend to grow by acquiring. Conversely, for smaller niche companies and start-ups, the increasingly logical expansion path is to grow by being acquired.

"Since the software industry has fairly low barriers to entry in terms of capital requirements, a business is relatively easy to start up," says Anthony Wang, president and chief operating officer of Computer Associates. "But it is not that easy to grow that business to a meaningful size. Over a period of time, many small and mid-size companies realize that they have peaked out and that the better way to leverage their product is to have it marketed by an established organization."

"Historically in software, acquisition has been a hallmark of success, not failure," adds Gilbert Mintz, cofounder and partner of Fort Lee, N.J.-based Broadview Associates, the software and services industry's leading deal-maker. "Good companies now have the option of playing the game either way. You may have the cash to make an acquisition, but it's fun being seduced, too."

The final two months of 1986 saw a flurry of software and services acquisitions as vendors sought to wrap up deals before the unfavorable tax changes for capital gains treatment took effect Jan. 1. The timetable of Computer Associates' purchases of both Integrated Software Systems Corp. and General Electric Co.'s Software International unit was affected by tax considerations, Wang acknowledges.

Other late-year mergers included MSA's purchase of Comserv, Inc., Bell South Corp.'s buyout of Dataserv, Inc., Emhart Corp.'s acquisition of Planning Research Corp. and the sale of most of Honeywell Information Systems to Honeywell's joint venture with NEC Corp. and Compagnie des Machines Bull.

Continued from page 43

Because many deals were rushed through at the end of 1986, the first half of this year may be a relatively quiet period for computer industry consolidations. Although most industry observers believe the pace will pick up again in short order, the tax changes may mean that vendors will structure their deals differently.

"It will not be as advantageous for the seller to sell individual product lines or parts of the business," says Charles Varga, publisher of "The Cerberus Report," a biannual survey of industry acquisitions. "Sellers will come to the table saying, 'You are going to have to buy my company and its stock, not just the assets.' "

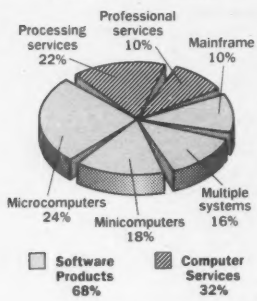
Such a change could spell trouble for firms like Atlanta-based microcomputer peripheral vendor Intelligent Systems Corp., which is attempting, so far unsuccessfully, to sell off pieces of its business.

Intelligent Systems and other would-be sellers may have a more difficult time this year trying to market themselves to companies outside the computer business, according to some observers.

Acquisitions breakdown

Primary business of software and services companies acquired

First Six Months 1986



Information provided by Broadview Associates

The acquisition of a compatible "corporate culture" may have become an overused buzzword when discussing merger possibilities, but the recent fireworks surrounding the services industry's largest buyout illustrate the potential risks of acquisitions.

The highly publicized management feud between Electronic Data Systems Corp. (EDS) founder H. Ross Perot and General Motors Corp. Chairman Roger Smith may cause other noncomputer firms to reconsider major high-technology investments.

"Old-line industrial companies will have to stop and think a little more about whether it's the right thing to do," says James Kelly, president of W. T. Grimm.

"Are the problems between GM and EDS just a conflict of personalities, or are there deeper factors that have kept the transaction from being successful?"

"My gut feeling tells me that companies not already in the business will shy away from it," says Computer Associates' Wang.

An interesting test case in 1937 will be the marriage of Emhart, a large, diversified manufacturer of adhesives and industrial materials, and Planning Research, a provider of computer-related professional services.

Moving into high tech

Another non-computer firm expected to continue its move into high tech by acquisitions is Citicorp, which purchased Quotron Systems, Inc. last year for $680 million.

Despite the preponderance of acquisitions within the computer industry, the business has generally been a safe harbor from the wave of hostile takeovers sweeping corporate America.

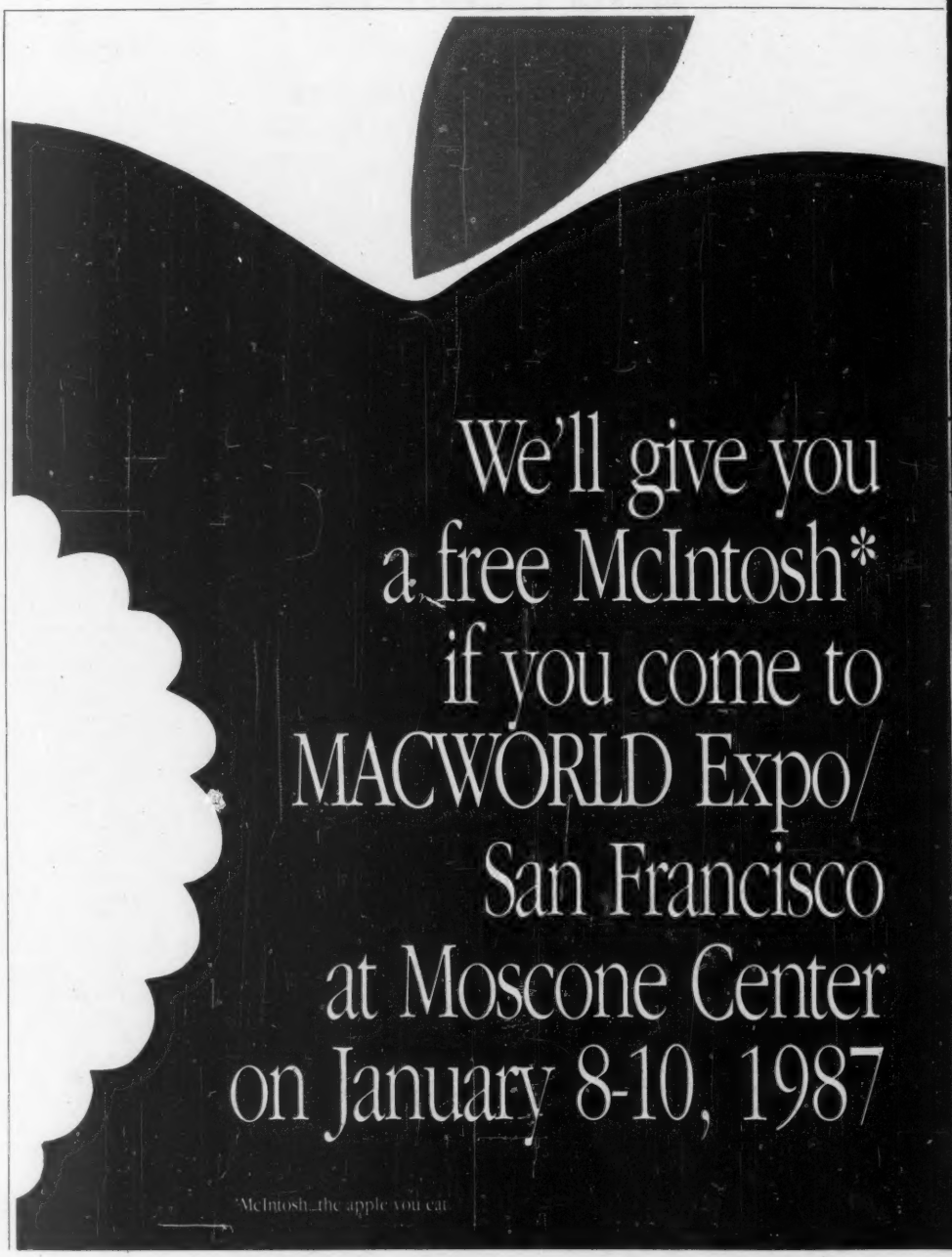
But that could very well change this year as potential buyers continue to monitor the two notable exceptions that so far have been successful: Burroughs' buyout of Sperry to form Unisys Corp. and Sterling's takeover of Informatics General Corp.

Concern increases

"You can tell the public companies in our industry are increasingly concerned about it, adopting poison pill plans and changes in shareholder voting rights," says Broadview's Mintz. "Before Sterling succeeded with Informatics, companies wondered how they could run a software company after a hostile takeover.

"Now the targets will be those firms where management has not been doing a spectacular job. We will see several hostile attempts in 1987, and it will be a growing trend," he adds.

Mintz does not expect the participation of corporate raiders like Carl Icahn or Sir James Goldsmith in the software industry, however. "They generally like larger companies with hard assets," Mintz says. "But we may see our own versions of these people — raiders more conversant



with the computer industry."

Another predictable trend is the increasing participation of the Japanese, as well as the South Koreans, in the ownership of U.S. high-tech companies. In addition to realizing the financial attraction of U.S. equity because of the strength of the yen, Japanese firms recognize the importance of U.S.-based distribution channels for the U.S. market.

Nonetheless, the Japanese will generally stop short of making outright acquisitions, says "Cerberus Report" publisher Varga. "They would much rather enter the market through joint ventures," he says. "That is a simple cultural fact, regardless of the value of the yen."

Telcos ring up computer mart

Computer industry watchers will continue to keep a close eye on the seven regional holding companies, virtually all of which have entered the computer business, some aggressively. But there, too, potential acquirers are sobered by the experience of Ameritech.

The Chicago-based holding company purchased Applied Data Research, Inc. (ADR) in late 1985, just as the mainframe data base management market was slowing down and IBM was launching a highly aggressive market share war with DB2.

Last year, Ameritech sent one of its own executives to head ADR's management team, although both firms involved insisted the move was not related to current business conditions.

"We're spending a lot of time understanding the software business and whatever we may do there, we'll do it very carefully," says Joseph Ambrozy, vice-president of marketing and strategic planning for Bell Atlantic Enterprises, the unregulated arm of Bell Atlantic Corp.

"We're looking for aggressive growth in the computer area," Ambrozy continues, "but we will not do anything until we are absolutely sure that it is logical for us."

Nonetheless, Ambrozy expects the regional holding companies to continue to be acquirers. During 1986, Bell Atlantic bought the computer leasing unit of Greyhound Corp. to add to its already large stake in the computer business through computer maintenance subsidiary Sorbus, Inc.

"Once a customer knows he wants a specific piece of computer equipment, we can handle everything," Ambrozy says. "We can finance it, maintain it, repair it, refurbish it and resell it. We are an alternative distribution channel for the hardware vendors."

C. W.

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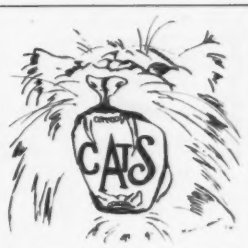
FORE-CASTERS

"I think the single most important issue from a user standpoint is information as a competitive advantage, that information and technology are important for competitive advantage," according to Melvyn E. Bergstein, a partner and a managing director in the management information consulting division of Arthur Andersen & Co. in Chicago.

"Next year, and over the long term, we'll see more of American senior management recognizing that. This is the overriding issue facing us into the next decade," he says, adding, "American senior management has yet to embrace this concept."

E. G.



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Japanese team up with U.S. marketers to penetrate mart

An oft-repeated axiom within the mainframe computer industry holds that Japanese vendors must establish strong relationships with U.S. marketing partners to successfully penetrate the American market.

That dogma has remained unchallenged during the last 25 years, as Japanese companies have entered the IBM-dominated U.S. mainframe market through various and sundry relationships with domestic computer vendors.

In 1962, NEC Corp. teamed with Honeywell Corp. to share technology. Eight years later, Fujitsu Ltd. became an investor and technology partner with Amdahl Corp. Hitachi Ltd. joined up with National Semiconductor Corp.'s National Advanced Systems Corp. (NAS) in 1979 after its original partner, Itel Corp., went bankrupt.

"Originally, it was a process that resulted from IBM's dominance of the industry," notes Bob Djurdjevic of Annex Research, Inc., a Phoenix market research concern. "It was a reaction by vendors that to compete, they had to form joint ventures at the R&D or marketing level to exploit each other's strengths."

For the future, partnerships will continue to be the only way Japanese vendors can survive and flourish in the domestic mainframe computer market, industry analysts say. While Japanese mainframe computer makers do have the technological prowess to compete with mammoth IBM on its home turf, they still lack the marketing clout and software aptitude necessary to seize market share on their own, analysts declare.

NEC's proposed participation with Compagnie des Machines Bull in France in the purchase of the bulk of Honeywell Corp.'s computer business provides the most recent evidence that the partnering trend is here to stay [CW, Dec. 8]. By taking an equity stake in the company to be formed from Honeywell Information Systems — and which resells NEC's mainframes — NEC is protecting an installed base that relies heavily on its technology.

Frank Gens, mainframe analyst at International Data Corp. (IDC), a market research firm in Framingham, Mass., says partnerships enable Japanese vendors to quickly build demand for their mainframes and create economies of scale.

"What these partnerships are about is the necessity for the Japanese vendors to drive as much volume through as many channels as possible," Gens says.

Still, rumors persist that both Hitachi and Fujitsu will eventually bypass their U.S. partners that market IBM plug-compatible mainframes (PCM) and sell directly to domestic customers. NAS resells Hitachi-made PCMs, while Amdahl designs its PCMs using Fujitsu components and subassemblies and IBM-licensed operating systems.

For the foreseeable future, partnerships will continue to be the only way Japanese vendors can survive and flourish in the domestic mainframe computer market.

Both have set up U.S. subsidiaries to sell a wide range of computer and communications products. Hitachi will soon open a manufacturing plant in Norman, Okla., to produce large-scale disk drives; the move has spawned rumors that direct sales of PCMs in the U.S. may not be too far behind.

Amdahl and NAS executives bristle at the suggestion that their Japanese partners would leave them high and dry.

"It's something we don't think will happen," says Jerry Ungerman, vice- president and general manager of U.S. business operations at NAS. "Hitachi has had a similar relationship with General Electric Co. for power generation equipment since 1937. It's their way of doing business."

Amdahl President Jack Lewis agrees. "We have a set of agreements with Fujitsu regarding the use of patents. They use some patents we own, and we use some of theirs. Their computers are not sold here for that reason," he explains.

While some analysts contend that PCM distribution agreements between Japanese vendors and their

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U.S. vendors are not set in concrete, Hitachi and Fujitsu have too much to lose by cutting NAS and Amdahl loose.

"I was at Hitachi one year ago, and they said it was not their intent to cut their tie to NAS," Annex's Djurdjevic recalls. "They're a conservative company without an aggressive marketing organization. What would they gain from such a move, considering how well NAS is doing?"

Fujitsu, Djurdjevic points out, owns 47.5% of Amdahl and therefore would not make a move that could hurt its U.S. partner. "Fujitsu is a more aggressive and younger company than Hitachi. They're considered an upstart," he notes. "Although they don't do things by the book, I don't think they'd enter the mainframe market here directly."

IBM software compatibility

One thing is clear: Fujitsu is slowly moving away from strict IBM software compatibility. Fujitsu, analysts say, is adopting a proprietary architecture in response to IBM allegations that the Japanese company continues to infringe on its systems software copyrights. The case is being decided by a panel of arbitrators.

Some analysts therefore believe that Fujitsu is preparing to either enter the U.S. mainframe market with a proprietary architecture or attempt to sell Unix-based processors via a joint venture with AT&T.

Either way, Amdahl's Lewis claims his firm will survive.

"That's why we design all of our products and why we don't reverse-engineer from IBM," he says.

Meanwhile, both domestic PCM vendors are riding the crest of demand for their top-of-the line IBM 3090-compatible machines.

Both claim they are increasing PCM market share at the expense of IBM by hewing closely to the age-old philosophy of offering increased functionality at a 15% to 20% discount over Big Blue. Amdahl and NAS currently account for approximately 10% and 8% of the PCM business, respectively, and are expected to lift their shares by a few percentage points this year.

The domestic PCMs believe they owe their recent success to end users who do not want Big Blue to dictate how they run their shops.

"Business was up 60% [in 1985] over last year," NAS's Ungerman claims. "We are a real alternative to IBM in the market, meeting the needs and wants of the customers."

IDC's Gens says he believes that the PCMs' success is more a result of product life cycle circumstances than actual long-term shifts of loyalty. PCMs are just now seeing a revenue jolt from their 3090-compatible processors, while IBM's shipments of its high-end mainframe have already climaxed.

"It's only a matter of a few percentage points," Gens says of the market share gains the PCMs have made. "That probably will turn around once IBM enhances the 3090 or brings out its next mainframe generation.

"In reality," he continues, "the PCMs are not really battling IBM; they are battling each other."

The inheritors of Honeywell's computer business face more pressing problems.

Honeywell has continually lost market share during the last few years, as many of its customers have jumped on the Big Blue bandwagon. Honeywell held 5.4% of the domestic mainframe market in 1985, according to Dataquest, a San Jose, Calif., market research firm, compared with IBM's 68.3%.

Honeywell Information Systems' customers, however, will probably benefit most from the change in ownership, notes Kimball Brown, a mainframe analyst at Dataquest.

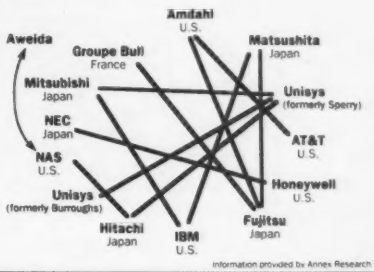
"If I was a Honeywell user, I'd applaud this move," Brown says. "NEC will provide the price/performance enhancements that customers will need and save them from Honeywell, which stopped investing in computer industry a long time ago."

Brown says it's NEC that IBM has to watch, not the PCMs. "They've got a proprietary machine but have a lot of software dug in it. They could get a lot of conversions because of the cost-effectiveness of their technology," he says.

A. A.

International connections

Joint ventures among major vendors



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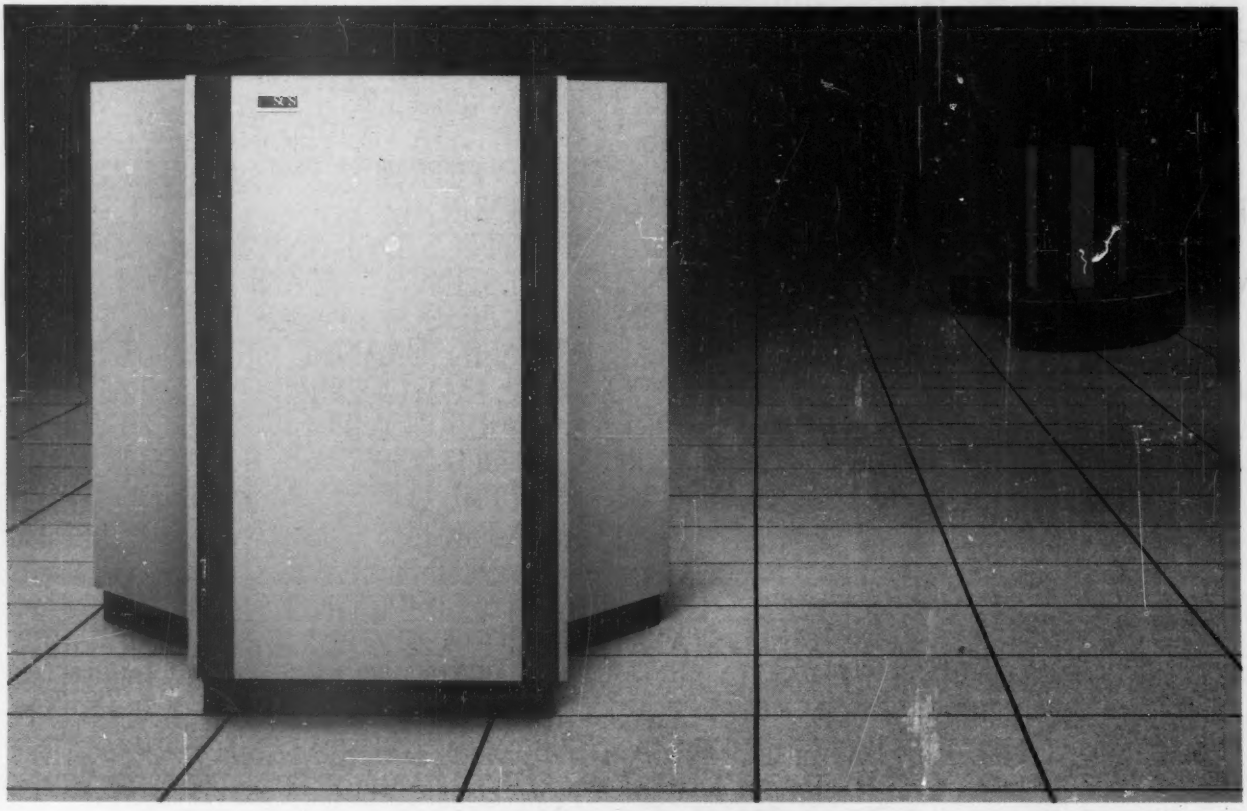

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Programmer power

Expert systems-based front ends speed design process, enhance user satisfaction

BY CHARLES BABCOCK

At a software conference in Phoenix recently, an IBM executive noted that artificial intelligence has been added to a development system in a way that speeds the quality and output of applications.

A murmur went around the room as his listeners exchanged glances of anticipation and disbelief. Ways to reduce the application backlog have been advanced over and over again — yet the backlog remains largely intact, stretched two to three years beyond available resources at most MIS shops.

Much has been promised from artificial intelligence as well, and yet software development remains a tedious, labor-intensive process. But Robert Berland, IBM's director of strategic planning, appeared to think that this time a solution of sorts was at hand.

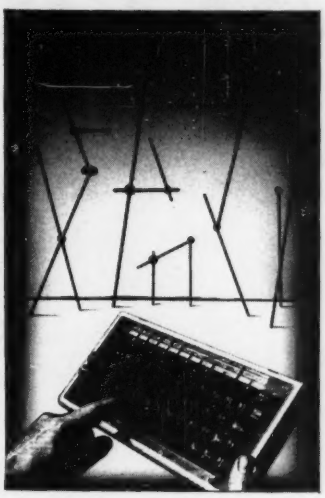
"One of the companies here is using AI in an extremely exciting and innovative way, which is applicable to almost everybody," he said at the 25th-anniversary conference of ADAPSO, the software and services company association.

"This company is using knowledge system techniques to interact with the end user, to quickly prototype the end user's front end of the application. . . . They're quoting not only significant productivity improvements in the front end of the cycle but a significantly higher return in user satisfaction," Berland said.

The company he described is believed to be Transform Logic Corp. in Scottsdale, Ariz., which employs a forward-chaining expert system in building applications, according to knowledgeable observers.

But it could be a number of other firms working with expert systems or some form of rules-based programming with the goal of bringing new power to software development, such as Bachman Information Systems, Inc., Reasoning Systems, Inc. or Cortex Corp.

A user of Cortex's application development system The Application Factory says his firm, Texas Eastman Co. in Longview, Texas, is getting a "4-to-1 or 5-to-1 productivity increase" by developing Cobol applications with it on a Digital Equipment Corp. VAX 8650. When a rule-based, diagramming front end is added to the system, which is expected later this year, it will speed up the specification and design process, the front end of application building that has traditionally been most resistant to automation, says Raymond Johnson, supervising analyst for manufacturing systems at Texas Eastman.



CARL WESLEY ILLUSTRATION

"It's absolutely certain that over the next few years artificial intelligence concepts are going to work their way into the software development field," predicts George Schussel, president of Digital Consulting, Inc. in Andover, Mass.

Although there is still far to go, software development is subject to the same mathematical rules and logic that computer-aided design and manufacturing has brought to the hardware engineering process, according to Richard Phelps of Cortex, a Waltham, Mass., firm.

When applied to software development, AI "can do the classic expert system job of capturing the expertise of world-class people and putting it at the fingertips of people who do that job day to day," says Arnold A. Kraft, former project manager for DEC's Xcon expert system, one of the most successful applications of artificial intelligence to date.

DEC uses Xcon to configure the equipment needed to fill orders generated in the field, saving an estimated $18 million a year.

Kraft now works with Charles W. Bachman, inventor of Bachman Diagrams and an originator of data base management systems, on expert systems for software development. They are working together at Bachman Information Systems in Cambridge, Mass.

Skilled software developers, including author James Martin, have developed techniques that automate one or more of the

Continued from page 51

steps of software development, but the automation "at point A doesn't connect to point C," Kraft says.

With software development proceeding through a series of dissimilar steps, artificial intelligence must help developers "make the transition from one level to another, from specification to design and from design to code," says Esther Dyson, publisher of "Release 1.0," a computer industry newsletter.

The biggest gains, says Marietta, Ga.-based consultant Vaughan P. Merlyn, will come when AI is used to provide an interface through which the end user "expresses the rules that the business is all about," and those rules are translated automatically into the specifications, design and code of the application.

Although the exact form of such an interface cannot be foreseen, Merlyn says he believes it will be "some sort of graphics approach" readily understood by end users. Such an approach would allow "the end user to do the application development. It will externalize much more productivity to the end user," he adds.

Schussel says English-language interfaces will make it easier for end users to invoke system power in developing applications, such as an interface that can transcribe English-language queries into IBM SQL statements.

Automated front ends

If new assistance on the front end of software development — the analysis, specification and design phase — can be combined with more traditional development methods, the result will be a step forward for application development. Automated front ends could, for example, be combined with rapid prototyping, which incorporates user feedback as the application is developed, according to observers and software developers.

Several well-muscled systems exist to provide assistance in automating much of this process in the mainframe world, such as Pacbase from CGI Systems, Inc., Telon from Pansophic Systems, Inc., APS from Sage Software, Inc., Use-It from Higher Order Software and Gamma from the former Tarkenton Software.

In the mainframe world, "pieces of the development process have been automated, but no one has a coherent system," Bachman observes. Bachman Information Systems is attempting to develop an integrated development system using expert system modules.

Many organizations are not waiting for a new generation of development systems. They are proceeding with the biggest and best mainframe development systems available, although the expense of these systems, which cost from $150,000 to $300,000, represents a major commitment to a particular technology and does not encourage experimentation, notes John Landry in his report to ADAPSO on software development technology.

Nevertheless, several companies report they are making productivity gains that whet their appetite for what the next generation of development systems may bring. One example is IDS/American Express in Minneapolis.

When IDS, a personal financial services company, was taken over three years ago, its new parent, American Express, directed it to rewrite all of its financial systems and organize them on a customer basis rather than spreading each account across several unrelated applications, recalls Alan F. Bignall, vice-president of corporate systems.

The unit was going to have to undertake the process while experiencing a 20% annual growth rate and while managing the assets of $29 billion of its customers' investments, he adds.

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Systems' Pacbase to launch a data driven development process controlled by a data dictionary and exploiting stored modules of reusable code. IDS generated its first major application, client administration and management, in six months.

Pacbase generates about 88% of the Cobol needed for each application, with the rest provided by custom programming. Furthermore, Bignall finds he can devote an unusually high percentage of his 400 programmers — more than half — to new development, although he says it still takes a lengthy two to three months to learn Pacbase's fourth-generation language and system procedures.

Integrated development emerges

A glimpse at how an integrated development system might function is provided by an example from the minicomputer world.

Cortex Corp. has tied an IBM Personal Computer AT-based graphics workstation to a code generator on the Digital Equipment Corp. VAX, using the PC to create and capture diagrams that are precise enough to represent program specifications.

The process resembles author James Martin's active diagramming techniques in that the diagrams' symbols can precisely capture data entities and their relationships, according to Richard Phelps, vice-president of marketing.

The diagrams can then be fed automatically from the AT into the Application Factory's code generator on the VAX, which in turn produces a Cobol application.

The diagramming front end is due to become available in the first quarter of 1987.

Two users of the VAX-based application development system without the diagramming front end have reported productivity gains of 4-to-1 or higher.

It allows developers to build prototypes with end users in the product's fourth-generation language, which is then converted into a Cobol application.

At Texas Eastman Co., a subsidiary of Eastman Kodak Co. located in Longview, Texas, shop floor manufacturing applications are generated by the Application Factory.

Even when Fortran subroutines have to be added to the applications by programmers, Texas Eastman realized a gain of 4- or 5-to-1, according to Raymond Johnson, supervising analyst of manufacturing systems.

At the Du Pont Co., a process that exposes the end user to rapid cycles of prototypes has led to productivity gains of 6-to-1 using the same development system, says Scott R. Shultz, manager of Information Engineering Associates.

The recently announced merger of former football star Fran Tarkenton's firm, Tarkenton Software, Inc., which features its Gamma application development system, and James Martin's diagramming tool firm, Knowledgeware, Inc., aims to bridge the gap in the mainframe world, spokesmen for the companies say.

C. B.

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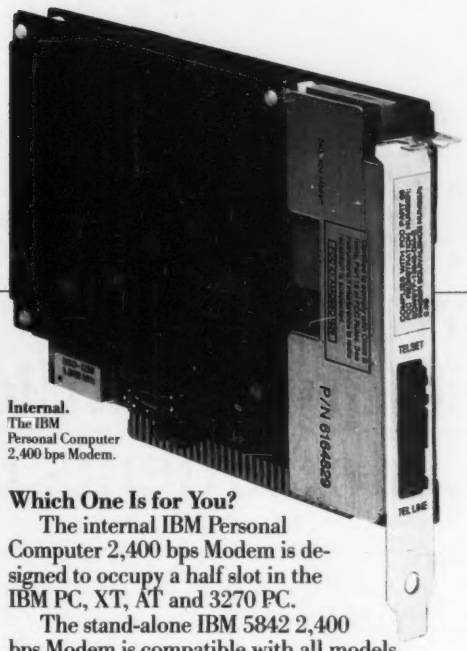

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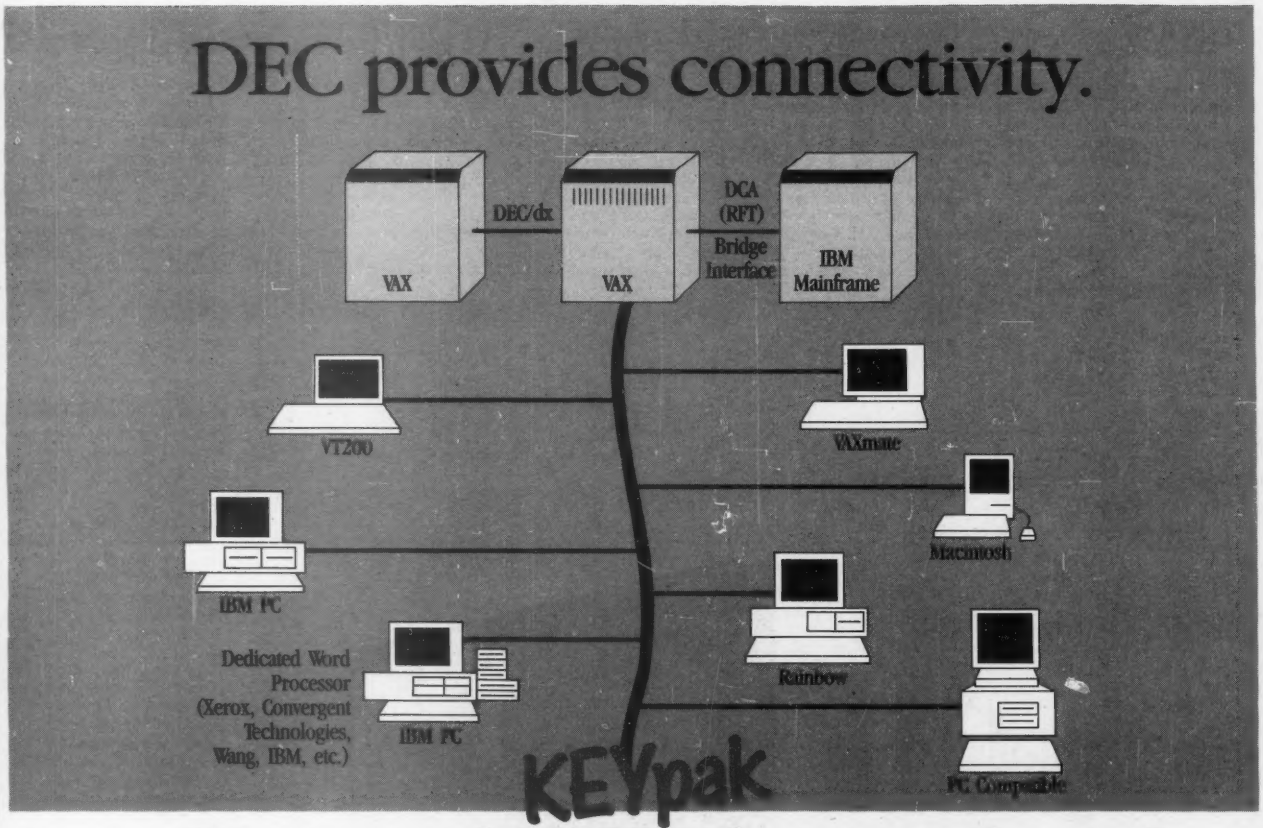

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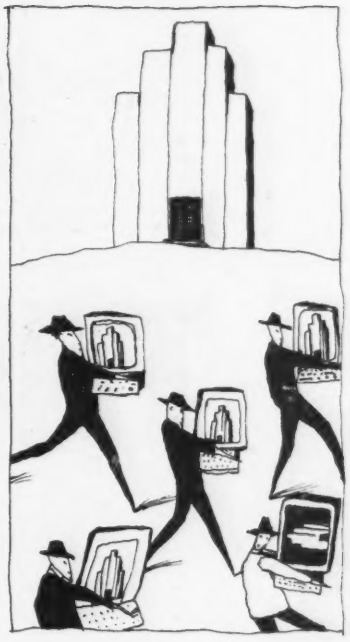


BLAIR THORNLEY/ILLUSTRATION

BY NINAMARY BUBA MAGINNIS

Distributed data base software has the potential of paying off in more CPU power and greater computing flexibility, according to John Rector, technical staffer at the California Institute of Technology's Jet Propulsion Laboratories (JPL), where a pilot distributed data base has been implemented.

MIS managers are beginning to examine distributed data base as a means of giving users the information they need without having to locate data on a network. In a fully distributed environment using a relational data base management system, users do not have to worry about where the data is filed. They just ask for information using a standard data access language, such as IBM's SQL, and the data base management system finds and delivers it.

Margaret Herrick, president of the Cambridge, Mass.-based data base consulting firm Margann Associates, says distributed data base systems were delayed by the personal computer revolution, which sidetracked its development. "Most vendors were looking to upgrade software toward distributed environments in the late 1970s. Then personal computers hit. Most vendors put resources they would have used for distributed data base products into personal computers. It looks to me now that they're gearing up again," Herrick says.

George Schussel, president of the Andover, Mass.-based Digital Consulting Associates, Inc., predicts that the most effective computing environment in the 1990s will consist of large numbers of local and regional computers running concurrently.

"In the 1990s, corporations using relational data base software over minis and mainframes will be able to have integrated, controlled, distributed data base software and spend less for computing than a company using one mainframe controlling 500 different terminals," Schussel says.

One problem with distributed data base technology is that no completely functional product exists today, observers say.

Distributed data base technology is emerging slowly because it entails a different way of thinking, says E. F. Codd, creator of the relational data base model and president of Relational Institute, Inc., a San Jose, Calif.-based nonprofit corporation. "I felt that in the computer field, if you don't have a precise underpinning or foundation for what you are doing, that you're leading people astray.

"The reason the relational approach is terrific for distributed data base is that it's the only approach that satisfactorily answered a number of user needs. One of the most important is distributed independence. That means programs you write should not be logically dependent on the way the data is presently distributed. They shouldn't be dependent on whether it's distributed at all. The same data should work in one central location or distributed."

Last year two vendors, Alameda, Calif.-based Relational Technology, Inc. (RTI) and Belmont, Calif.-based Oracle Corp., introduced data base products with some distributed capability. RTI's Ingres/Star and Oracle's SQL*Star (used by the JPL) support an open architecture that will allow data base distribution across multiple vendors' hardware and operating systems. Ingres/Star runs on Digital Equipment Corp. VAX hardware and the VMS and Unix operating systems. Support will extend to IBM VM/CMS, MVS and PC-DOS operating environments sometime this year. SQL*Star's distributed query capability runs under IBM's VM/CMS operating system, PC-DOS and DEC's VAX/VMS system. MVS and Unix capabilities will be available in mid-1987.

Both fall short of what a distributed data base environment should offer, although they do provide some distributed data base functionality, Codd says.

"The two products do enable one system to communicate with another, but they are weak in support of insert, update and delete," Codd notes. "And they are

Continued from page 55

not very strong in handling distributive independence. But they are first steps."

In Codd's estimation, IBM's R*Star distributed data base prototype is a superior model, but it is not yet available commercially.

The ability to insert, update and delete data throughout a distributed data base environment remains the Achilles' heel of the new technology. Data base consultants cite the example of a bank that has a distributed data base with its checking account data in New York and its savings account information in Boston.

If a customer wishes to transfer $100 from checking to savings, the distributed data base would deduct the sum from the New York-based information and add it to the Boston data base.

In a worst-case scenario, the distributed data base would allow the checking account to be depleted by $100 without updating the remote savings account data. Reliable distributed data base transaction processing would make sure that either both transactions happen or neither does, the observers explain.

There has to be a very powerful component that analyzes various different ways of executing the command and chooses the one that's calculated to be the most efficient. And that is called optimizing.

E. F. CODD
Relational Institute, Inc.

This type of guaranteed transaction processing is not possible in a distributed environment today, Codd and data base software consultants say. Vendors have not been able to ensure data integrity without tying up an inordinate amount of system resources. Until they do, the distributed data base environment is gravely limited, they say.

JPL, for example, views Oracle's software as a query distributed data base, according to JPL's Rector. The nonprofit JPL designs and develops satellites for the National Aeronautics Space Administration. Rector's branch of the lab uses two DEC VAX 750s and four Vaxstation IIs, tied together via a local-area network (LAN).

"I can get quite a bit of functionality with SQL*Star," Rector says, explaining that its distributed environment allows the union and joining of tables and insertion of data across various nodes.

SQL*Star can bring users a snapshot of remote data base information that can be queried and manipulated locally, Rector says. "A frozen picture of data is brought to a local node for use," he explains. "You can use the data to produce a weekly report.".

Oracle's distributed data base also saves on network overhead by holding remote connections open for as long as a session continues. If a user accesses the same long-distance table again, the system does not incur another connection and logon overhead to the remote data base, Rector notes.

Initial remote data base connections are slower than if information resided locally because connection and logon takes time, Rector says. "After that slowdown — I really can't say. I imagine there's a little slowdown, depending on network traffic that runs on the Ethernet LAN at any given time."

Oracle's Cohen

Codd says a key component of performance is the system's ability to use a data access language. "The language is such a high-level language, much depends on how the system does the translation from that high-level language to its own machine language," he says.

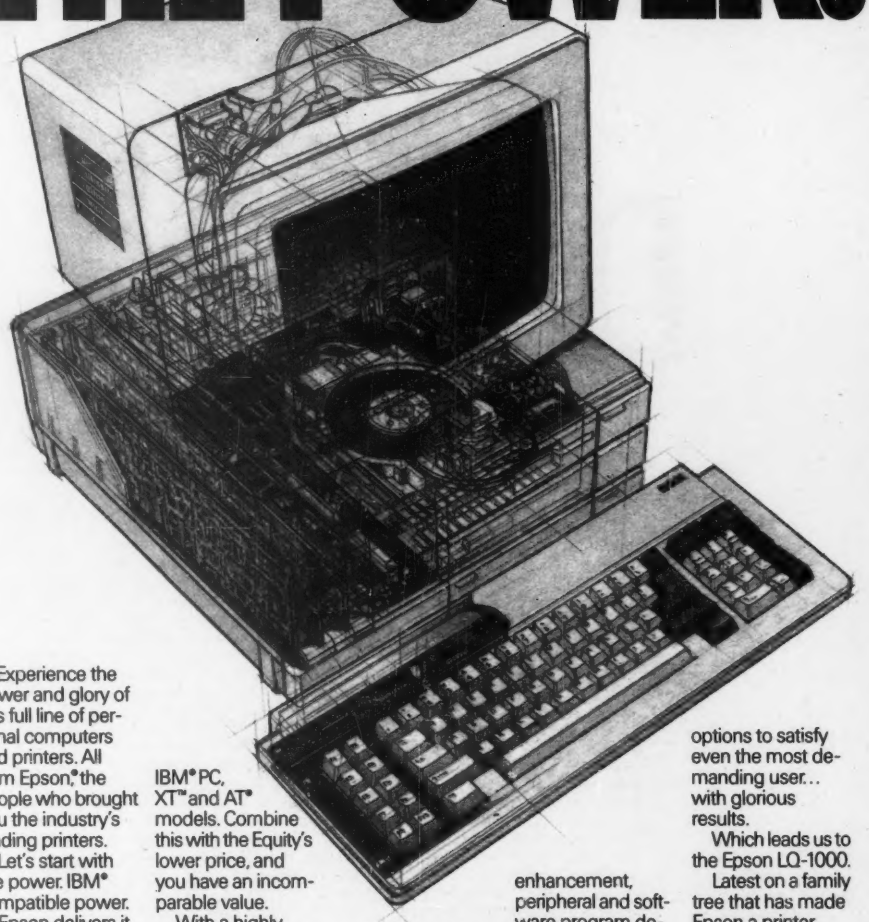
"That means there has to be a very powerful component that analyzes various different ways of executing the command and chooses the one that's calculated to be the most efficient," Codd says. "And that is called optimizing."

Optimization is something both RTI and Oracle claim to have incorporated in their commercial distributed data base software. "One of the open-ended challenges is that query optimization is an endless task," notes Oracle's Ken Cohen, director of product marketing.

Even with its present shortcomings, a few users are committing to a future distributed data base environment and claim the move will pay off. Carnegie-Mellon University in Pittsburgh, for example, has signed a five-year technology agreement with RTI.

Under the agreement, Carnegie-Mellon can expand its distributed data base across its computing envi-

THE POWER.



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ronment, which includes 75 DEC VAX 780 computers, a VAX 8700, 400 Microvaxes, 1,500 IBM Personal Computers, more than 200 IBM RT PCs and 2,000 Apple Computer, Inc. Macintoshes, without having to purchase a license each time the university adds a new machine to the DDB network, says Len Brush, Carnegie-Mellon's director of administrative systems.

Herrick

In exchange, the will serve as a test site for Ingres/Star, sharing benchmark data with RTI. At this point, Carnegie-Mellon has conducted a series of performance tests on Ingres/Star to measure speed in delivering query results.

Using nine different transactions against data bases of 40,000 to 50,000 records, the university found response times to match or exceed its performance criteria, such as update a single record in five seconds, Brush says.

Carnegie-Mellon ran its benchmark with 25 to 200 concurrent users. The systems director refused to cite specific numbers and results, however.

When RTI announces its Ingres/Star Version 6.0, reportedly within the next several months, Carnegie-Mellon will begin implementing its distributed data base. "Version 6.0 will make sure other folks get locked out when one person is trying to update the data base," Brush explains.

"There has to be some locking control to make sure the data base maintains its integrity while it's being updated. If 6.0 doesn't include this feature we'll wait until it becomes available."

Tony Schaller, Carnegie-Mellon's manager of system development, says the implementation of a distributed data base will require more upfront analysis. "The introduction of the network creates more variables for users out there to access data. The software will take care of maintenance and integrity, but we'll still have to support it," he notes.

Oracle's Ellison

Even with drawbacks, Carnegie-Mellon system officials say the distributed data base environment will solve data problems. "We see using a distributed data base environment as key to providing real service to the decentralized operation of the university," Schaller says.

A smaller post-secondary school, Earlham College in Richmond, Ind., is an alpha test site for Oracle's SQL*Star. Earlham College, a Quaker liberal arts college, uses one DEC VAX 11/750 for administrative functions and one for academic work. It has been using Oracle software since 1982.

Morgenthaler

"We've set up a situation where users are logging into one of the two nodes and running the Oracle kernel on that node while acessing data from either node," explains Charles Peck, Earlham's administrative analyst/programmer. "I'm not going to construct a distributed data base with a beta test site. The school is now non-distributed."

Earlham College, like Carnegie Mellon, will proceed to a distributed data base enviroment slowly. "It's not something I want to throw out to users very quickly," Peck says.

TREND-SETTERS

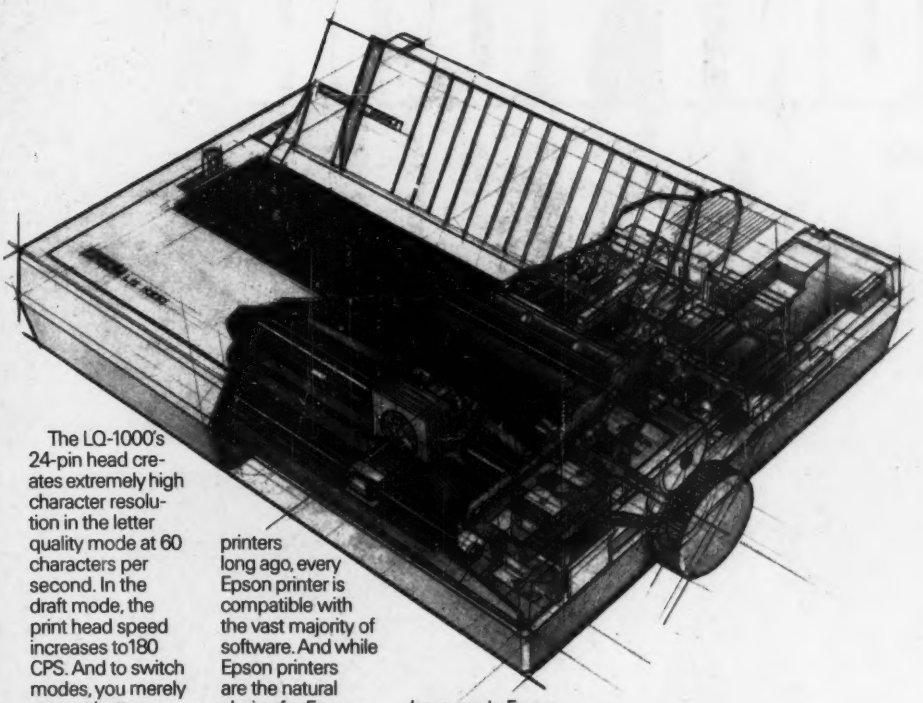
An information center SWAT team is helping users tackle data base management with a strategy leading toward self-sufficiency and away from traditional MIS roles, at the brokerage firm Smith Barney Harris Upham & Co.

The innovator is not a solo star, but a constellation: The redesigned information center/time-sharing staff is a team of five who help the user community discern their needs and design their solutions, and then free themselves to concentrate on maintenance or meeting user needs that used to be too low on the priority list to be done.

"In some cases we actually do design a full-blown system," said Michael Totoro, software developer. "But most of the time, we're a SWAT team. We help customers set up systems, and they run it."

Continued on page 60

THE GLORY.



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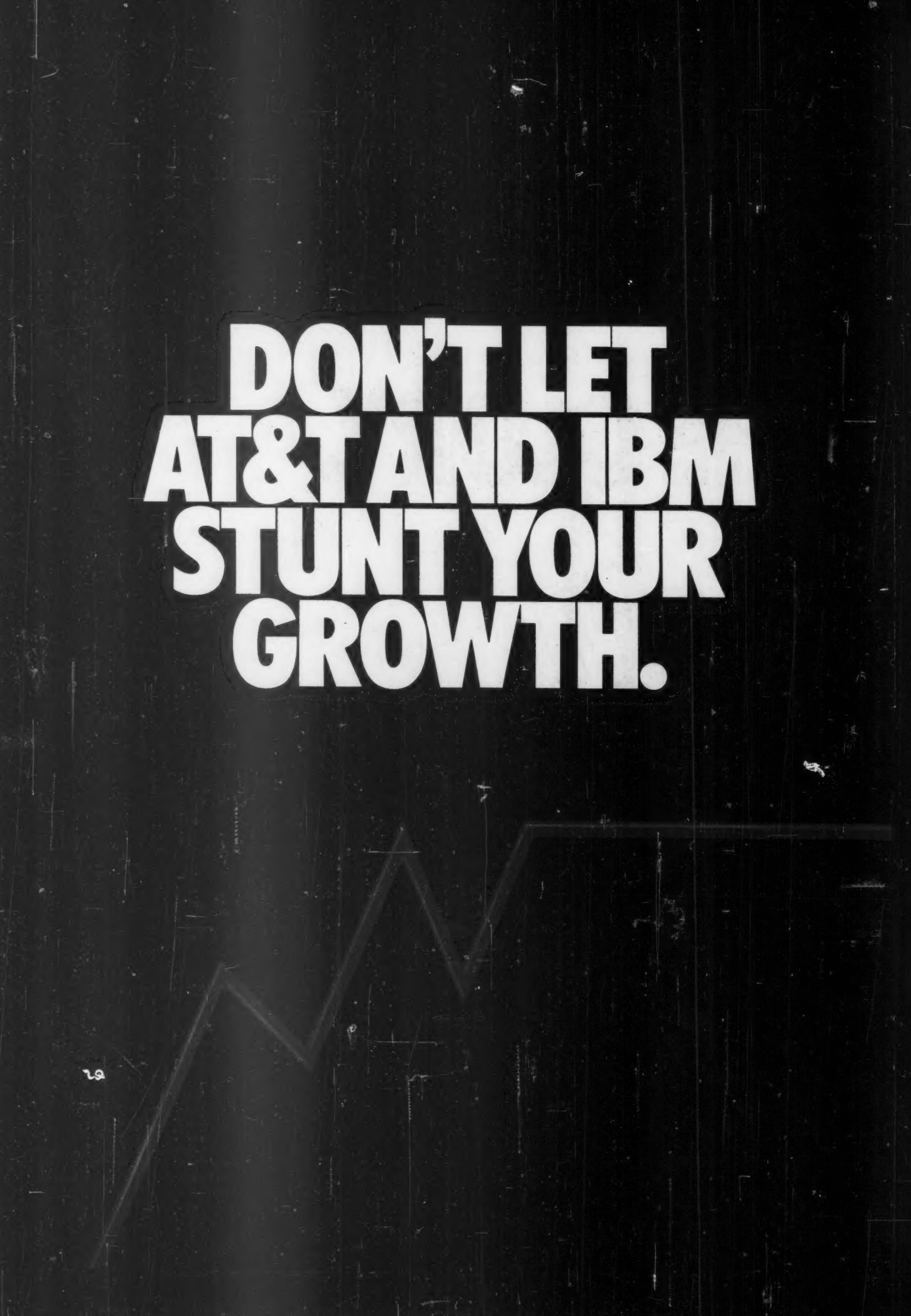

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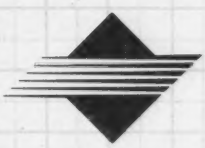

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TRENDSETTERS

Continued from page 57

The division is little more than a year old, but has already shown results, with more success expected in the months to come, according to Michael Levine, manager of the information center and time-sharing department.

He heads a team of four developers, each with a specialty in a fourth-generation language, which is the basis of their services.

"The whole division got started because of exorbitant outside time-sharing costs," Levine says. "We were brought in to replace and supplement that and realized you could do more with a time-sharing system."

The information center equipment includes an IBM 4381 Group II system devoted to VM. "We have eight to 12 3380 devices off the machine, two control units and two tape drives, expandable to four," Levine says.

The data bases they maintain are not huge, but are numerous. Accurate and easy access is crucial to Smith Barney's consulting services.

Previously, clients purchased time-sharing services. Now, they are fitted with fourth-generation language applications to meet their needs.

"The point was for investment bankers to get hold of much-needed data bases," Levine says. "Now they can do things they couldn't do before, because of the cost or because they were not aware of their resources."

For example, he adds, the corporate planning and analysis groups "had a hodge-podge of technologies."

The team consolidated those into an Information Builders, Inc. Focus data base that will be consistent among users, and more durable in case of personnel changes, since everyone in the department uses the same kind of tools.

Ambitious customers

"We help customers set up systems, and they run it if they're ambitious," Totoro says. Candidates are users "who are aggressive enough to come up with new things. With the technology we're presenting, we're not coding in traditional Cobol syntax.

"We're taking the VM/CMS environment and converting it to an information systems setup," Totoro says.

Totoro says he has about a dozen clients at any one time, in different areas of development ranging among corporate finance, inventories, budgeting, sales, stocks and securities.

"We give them a structure development approach." He will splice in the old code, add new and try again. "It gives them something to play with in trial and error."

Turnaround can be from a day to a week's work. "Usually it takes a day or two to get started coding," he said. "In about two weeks, they're up and running."

Education is a priority, Levine said. "We have courses in several areas, including languages and operating systems as well as Smith Barney data bases."

"It's really a new development in addressing application background," Totoro adds. "There's not a big consultant push here, but a role of information source. And we're the heart of it."

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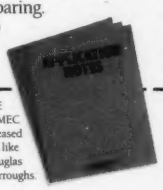

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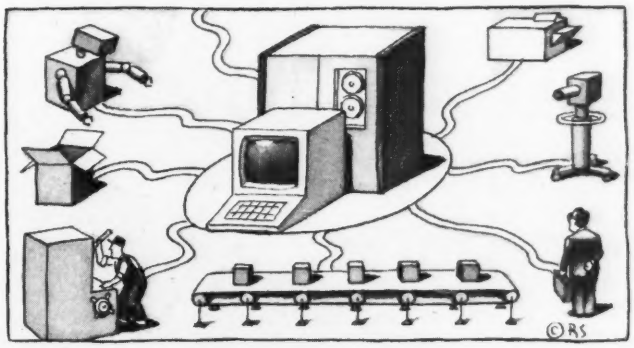


ROB SAUNDERS ILLUSTRATION

BY ROSEMARY HAMILTON

In Detroit, home of the U.S. automobile industry, the word around town is CIM. It's the word around Schenectady, N.Y., Greenville, S.C., and Wausau, Wis., too. Users and vendors alike are pointing to computer-integrated manufacturing (CIM) as the answer to America's smokestack industries' woes.

But CIM is a highly challenging issue that entails the automation and integration of an entire manufacturing enterprise. Its complexity has generated plenty of confusion, from which only a handful of manufacturers have emerged as successful CIM implementors. While each factory environment is unique, there are common threads that weave these early success stories together.

Both the Cone Drive division of Ex-cell-o Corp. and the Turbine Business Group of General Electric Co. have been involved in CIM planning since 1980, and both have been recognized by their peers through the Computer and Automated Systems Association of the Society of Manufacturing Engineers as successful CIM implementors. Although the two concerns have little in common regarding products and company size, recent interviews show that Cone Drive and GE share similar CIM philosophies: Both firms emphasize planning and management while downplaying technology.

Cone Drive's CIM system is based on an IBM Mapics system, a manufacturing resource planning system running on an IBM System/38 and an IBM Cadam system for engineering design work running on an IBM 4341, according to Paul Brauninger, director of MIS. Both systems, he says, have helped streamline operations.

Mapics, which was installed in 1980 and went fully operational in 1982, has helped reduce inventory by 25% and reduce quoted lead times by 50%, according to Brauninger. It has also enabled Cone Drive to cut the number of employees in the materials control department in half. Meanwhile, the Cadam system, which has been in use for three years, has reduced drawing time by 60%, getting part drawings to the shop floor at a quicker rate, Brauninger says.

Yet he is quick to add that the two IBM systems would have been useless had it not been for the management and planning portions of CIM that were concurrently implemented.

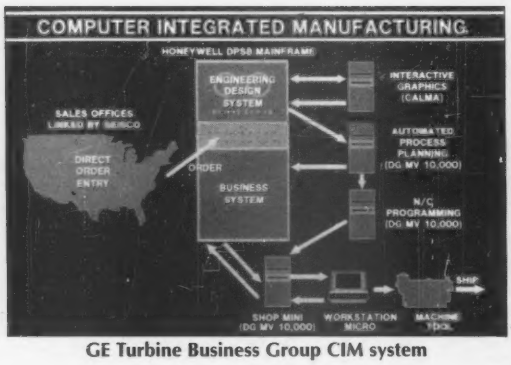
Back in 1980, Cone Drive was faced with "increasing pressure from our customers to do a better job of supplying the product to them on a timely basis with shorter lead times," Brauninger explains. The need to respond was critical. Customers could turn to Cone Drive competitors that were new to the scene from Japan, West Germany and Asia, Brauninger adds.

The original intent was not to automate but simply to find a better way to do business, he emphasizes. The computer systems were of secondary importance. In fact, well before computer systems were chosen, Cone Drive launched a training program.

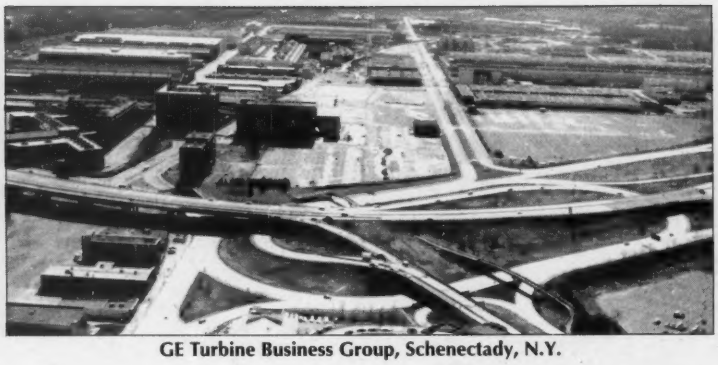
"Before we actually ordered anything, we told our people what our situation was competitively," he says. "We had to find a better way of doing things and we made sure that every person that worked here understood that."

Giving employees a hard dose of reality made other elements of the CIM plan easier to implement, Brauninger contends. Certain departments, such as engineering, moved to a round-the-clock schedule. Brauninger says the three-shifts policy surprisingly met with little resistance. Of the 12 draftsmen in engineering, only two had to be assigned a shift by their manager, he adds.

Cone Drive mapped out a strategy to automate the manufacturing and engineering end of the business, the first phase of which focused on establishing



GE Turbine Business Group CIM system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Continued from page 61

more control of the products and processes — for instance, reducing inventory and shortening lead time. The second step, begun last year and expected to be the focus of this year's efforts, is a more advanced level of automation — flexible manufacturing cells. Since it is a small company, integration has been a manageable issue. IBM Personal Computers are set up on the shop floor as well as in office areas throughout Cone Drive.

GE's Katronis

PCs are linked to either one or both host computers depending on the job function of their operators. This direct host-to-workstation cabling allows an operator on the shop floor to view a Cadam drawing file or to request shipping information from the Mapics program that resides on the System/38, according to Brauninger.

Brauninger adds that the CIM plan was guided by Cone Drive's top executives, a factor consultants consistently point out as critical. Since 1980, the management team that runs the day-to-day business at Cone Drive has also been responsible for the CIM program.

"We didn't set up a special group just to handle automation," Brauninger explains. "We used the same group that handles all of our problems, from labor contracts to price increases, so it became a normal part of the management of our business."

GE, too, reaps CIM benefits

When the Cone Drive team was hashing out its plan six years ago, a similar effort was underway at the GE plant in Schenectady. Since that time, the turbine plant has seen production cycles reduced by 30% along with a direct labor cost reduction of 20% and a 10% drop in indirect labor costs, according to Laki Katronis, manager of the technical systems group.

These results were achieved primarily through homegrown software for such phases of the manufacturing process as order entry and job scheduling. The backbone of this system is the batch processing envi-

ronment of the Honeywell, Inc. DPS-8, to which information is uploaded from Data General Corp. equipment, processed and then downloaded to the DG systems.

Interfaces were written to integrate the software — a process that was completed in 1984 — so data from one program could be applied to another, Katronis says.

Along with the application programs are two data bases, one for storing raster drawing files, which resides on a Digital Equipment Corp. VAX-11/785 in the engineering department. The other data base is for maintaining digitized part-recognition codes, and it resides on the Honeywell mainframe.

As was the case at Cone Drive, the first phase of CIM implementation concerned controlling manufacturing data. The plant is now looking to expand its networking capabilities to broadband cabling as well as expanding various software programs to remote locations.

'We established a 10-year master plan for a total CIM approach. We directed it to a specific area, the small parts business, and then expanded to different areas.'

— LAKI KATRONIS
General Electric Co.

Katronis attributes the success of the CIM system to a number of factors but tops that list with management commitment to integrate not only systems but the various departments. Katronis also cites long-term planning.

"We established a 10-year master plan for a total CIM approach," Katronis notes. "We directed it to a specific area, the small parts business, and then expanded to different areas."

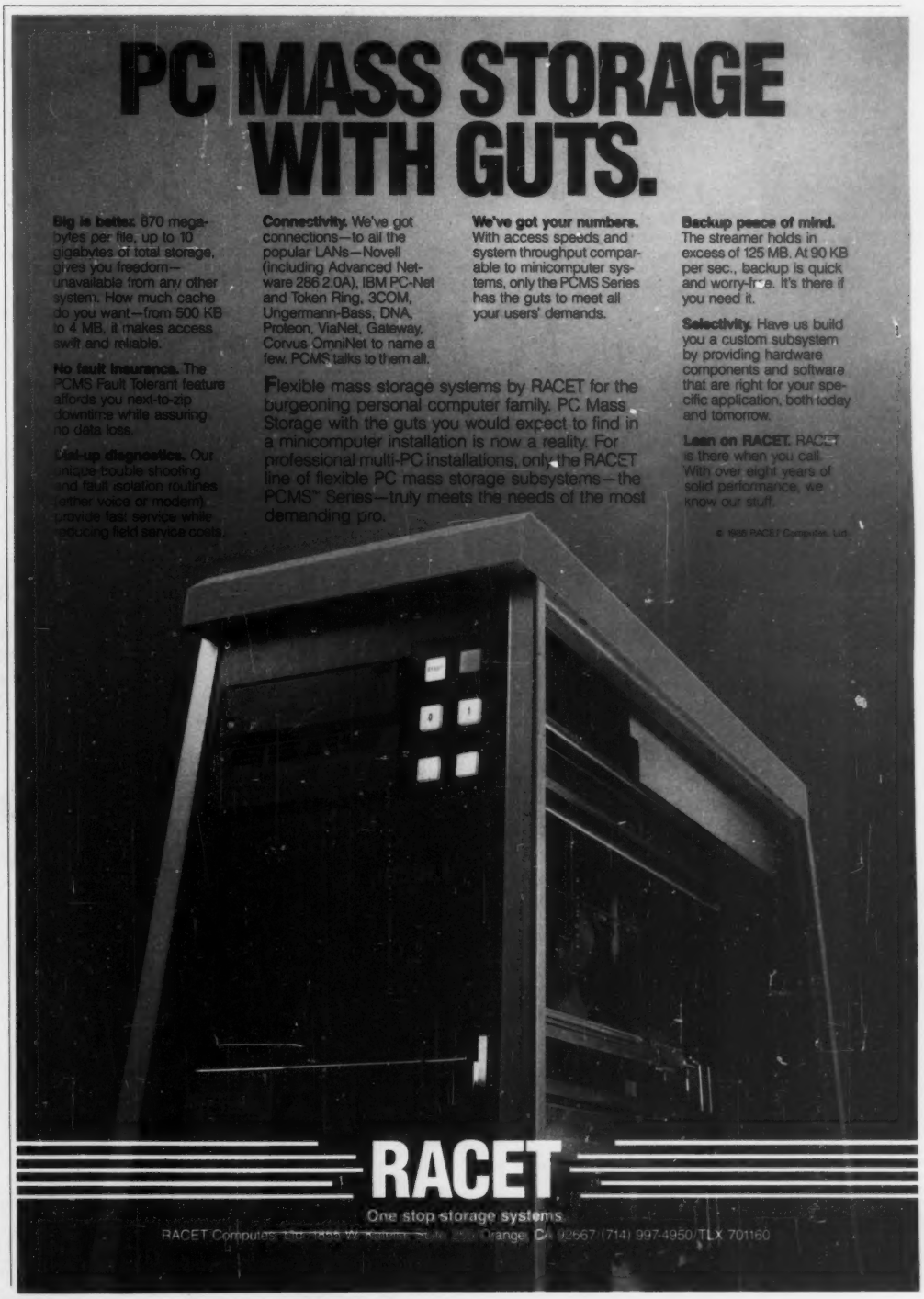
Systems reorganization

Management established a separate organization to handle the CIM efforts, a move that was part of an overall reorganization of the systems department in 1980 that ended the traditional MIS organization. The new systems group, called Turbine Business Systems Operations, consists of many divisions, such as Katronis's technical systems group.

"The idea is to use systems as a strategic weapon. It's a proactive organization," Katronis says.

"We had a top-down commitment for this, which is very important because CIM is a very hard road," he adds.

Cone Drive operations at Ex-Cell-O Corp.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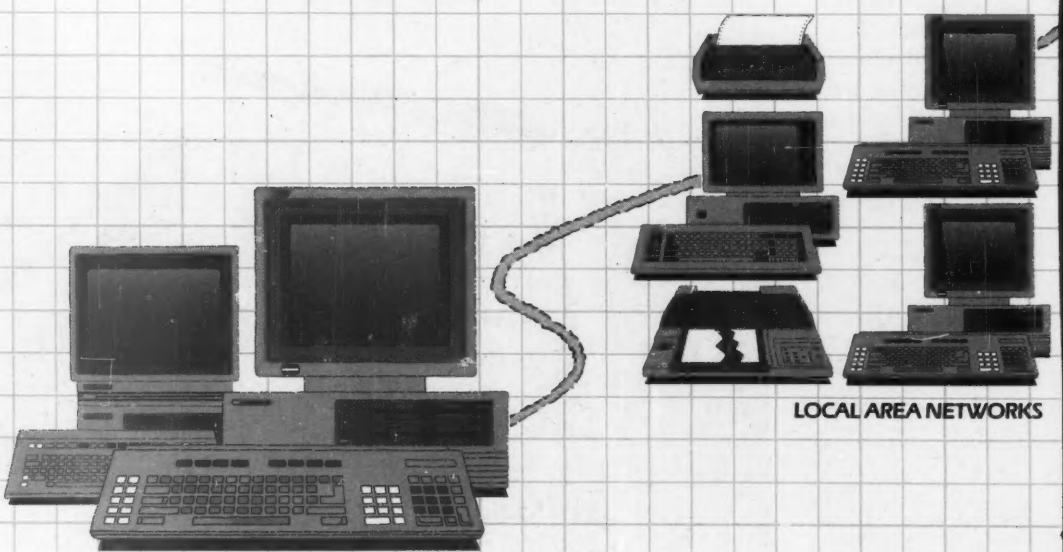

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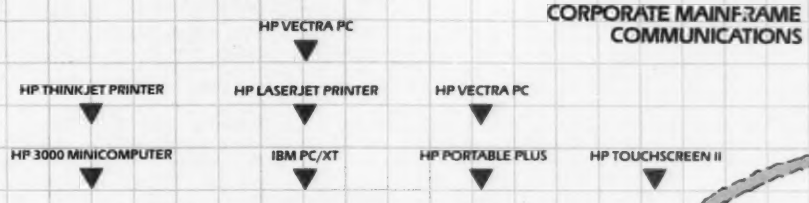

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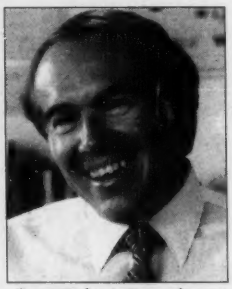
Swinging into the fast lane on the CIM highway

This year, Ex-cell-o Corp.'s Cone Drive Division and General Electric Co.'s turbine plant in Schenectady, N.Y., plan to go the next mile on the computer-integrated manufacturing (CIM) road. It is a long journey that is far from complete, both companies say, but it is also one that is necessary to maintain a competitive position.

Laki Katronis, manager of the technical systems group at GE, says the CIM plan has helped his plant respond faster to changing market conditions. Prior to the 1970s energy crisis, the bulk of the turbine plant's business was new systems, many of which had lead times of up to four years. Today, more than half of its business is replacement parts.

"Now we're talking about delivery in weeks, not years," Katronis says. "We have to react more quickly to customers' needs. A more flexible system helps you come up with the required information fast. I don't have the opportunity to continue to build on the CIM foundation they now have in place. I have to turn it over overnight. The setups, processes, all those things have to be flexible and modifiable so I can respond to a different environment."

Plans include expanding the basic CIM system at Schenectady to remote locations. The GE facility in Greenville, S.C., for instance, is scheduled to receive the factory management system. Katronis says



Cone Drive's Brauninger

his department will also be evaluating broadband cabling as an option for enhanced communications. They will also review the engineering graphics systems, currently from Calma Co., and will review both Calma and other vendors for possible upgrades.

Finally, Katronis says it is likely that the facility will eventually convert to a packaged manufacturing resource planning system, although that move has not been approved for this year.

"Our system is functioning and serving the purpose," he says. "But a real-time system and more capabilities are eventually going to be needed. What we have is working well, but that doesn't mean it doesn't need improvement. All systems need improvement."

Paul Brauninger, director of MIS at Cone Drive, says the first flexible manufacturing cell, which incorporates just-in-time principles, will be completed this year. The company has also scheduled the review of bar code technology for next year, and Brauninger says he hopes to incorporate a bar coding system this year.

To Brauninger, the flexible cells and bar coding add to the ammunition Cone Drive has been stocking up for six years against its competitors. "If you can't do a good job of supplying a product at a low cost, your life expectancy is very short," he comments.

R. H.

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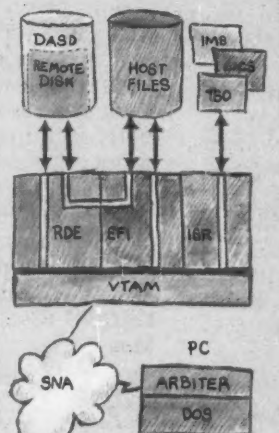

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Different managers, similar CIM

While the two men who head up the computer-integrated manufacturing (CIM) efforts at Ex-cell-o Corp.'s Cone Drive Division and at General Electric Co. are responsible for vastly different operations, they also have much in common.

Both take a realistic approach to CIM that involves using existing technology or homegrown software programs, contrasting sharply with the flashy factory-of-the-future picture painted by many consultants.

In fact, both Paul Brauninger, director of MIS at Cone Drive, and Laki Katronis, manager of the technical systems group at GE in Schenectady, N.Y., downplay the role of technology in their CIM efforts, saying that planning and management are just as critical to their CIM programs.

"In 1980, we turned toward technology to see how to best apply it. Computer technology was almost an afterthought," Katronis says. "Our intention was to create a flexible manufacturing system that takes care of the total business. We didn't go so much for robotics or manufacturing cells because we were facing a problem where it seemed like management of information was the most critical thing to do."

Brauninger agrees. "You basically have to do a good job of running your business, and you use the computer just as a tool. It does give you a better tool than had previously been available to you, but you still have to run the business like a business."

R. H.

CIM firms miles apart

More than 850 miles separate Ex-cell-o Corp.'s Cone Drive Division's Traverse City, Mich., headquarters and General Electric Co.'s Schenectady, N.Y., turbine plant.

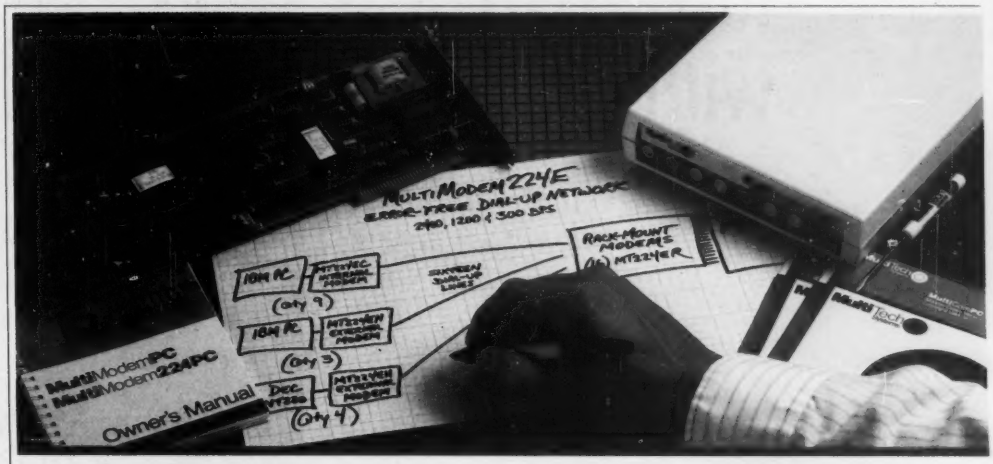
Aside from their similar computer-integrated manufacturing (CIM) philosophies, they are worlds apart. Cone Drive's primary motivation to launch its CIM program was increased foreign competition, while the GE turbine plant was faced with a basic shift in its market — customers, with less money to spend, bought less.

Acquired in 1955 by Ex-cell-o, Cone Drive manufactures capital goods machinery. The GE plant, which shipped its first product in 1903, makes the massive steam turbine engines used primarily by public utilities to generate power.

Cone Drive found that its customers were turning toward competitors from Japan, West Germany and Asia, MIS director Paul Brauninger said. The GE plant found that with the 1970s' energy crisis, customers were making do with existing products. Laki Katronis, manager of the technical systems group at the GE plant, says what had once been a business ratio of 70% new systems to 30% replacement parts has now completely reversed itself.

Cone Drive, which has spent about $1.2 million for its CIM efforts, has relied on one vendor: IBM. GE, which estimates the steam turbine plant's CIM expenditure at $50 million, has equipment from Digital Equipment Corp., Honeywell, Inc. and Data General Corp.

R. H.



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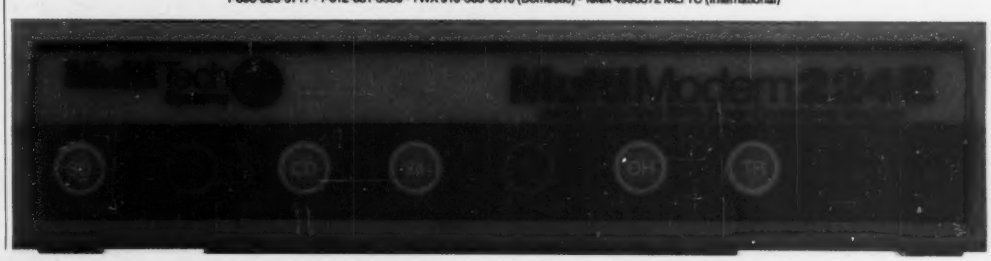
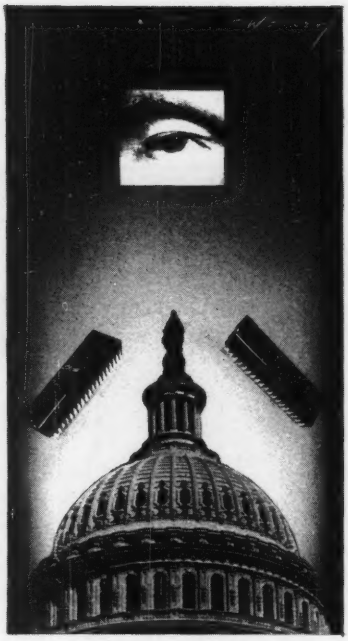


U.S. turns inward to deal with challenge

Government looks at business to place blame, repair deficit



CARL WESLEY ILLUSTRATION

BY MITCH BETTS

The "international competitiveness" of corporate America will surely be the buzzword in the nation's capital in 1987.

"A lot of the U.S. Congress's time will be spent on trade and competitiveness, and of course the computer field will come up for a lot of attention," says John Clement, director of governmental activities for the American Federation of Information Processing Societies (AFIPS) in Reston, Va.

The fears underlying the buzzword already have spawned a bevy of think tanks and commissions whose goal is to come up with policy recommendations for reversing the downturn in U.S. competitiveness in the world economy. Proposals for beefing up high-technology education and research and for creating new agencies are likely, but it is not clear whether these ideas will prevail in the budget-cutting climate of 1987.

The competitiveness theme has triggered a round of surprising business-bashing speeches by Reagan administration officials, who charge that "bloated, risk-averse, inefficient and unimaginative" corporate bureaucracies are to blame. "We underinvest in R&D while some high-priced private managers seem to spend less time developing R&D budgets than they spend on reviewing their golf scores," says Richard G. Darman, the deputy treasury secretary.

Analysts say that what the usually pro-business Reagan administration is trying to do is to subtly deflect Congress's attention away from protectionist trade legislation and toward flaws within U.S. business management.

"The overall theme seems to be the necessity to look inward as well as to foreign trade practices in addressing the problems associated with our large trade deficit, which is unlikely to melt away quickly despite the dollar's depreciation," says Stephen D. Cohen, an analyst with Washington Analysis Corp. in Washington, D.C.

But Cohen says the trade legislation that the Democratic-controlled Congress produces will not be protectionist anyway, if protectionism is defined as the unilateral imposition of import barriers to protect ailing industries.

"An aggressive — not protectionist — U.S. trade bill is likely to be enacted into law in 1987," Cohen predicts.

That's good news for the computer industry, which, although it generally opposes protectionist legislation on the grounds that it invites retaliation that would hurt the multinational computer industry, supports a tougher policy than exists now.

Few members of Congress believe that protectionism works in the long run, Cohen says, so trade legislation is more likely to knock down perceived protectionist barriers in other countries and reduce the president's flexibility to act against unfair foreign trading practices.

Consequently, it seems likely that Congress will resurrect the industry-supported telecommunications trade bill that came close to enactment in 1986. The bill was intended to open foreign markets to U.S. telecommunications products and services [CW, June 9].

Aimed at trade policies in Japan and Europe, the bill would require the president to negotiate trade agreements that remove foreign barriers to exports of U.S. telecommunications products and services. If the talks fail, the president would be forced to restrict foreign access to the U.S. market.

Industrial competitiveness is one of the topics to be studied by a proposed Information Age Commission. Industry and government sources predict that Congress will pass legislation in 1987 to create a two-year, privately funded commission for studying Information Age issues [CW, Oct. 27]. Strongly supported by ADAPSO — the computer software and services trade

association based in Arlington, Va. — the bill is sponsored in the Senate by Sens. Sam Nunn (D-Ga.) and Frank R. Lautenberg (D-N.J.).

"I think it will breeze through the Senate and meet a rocky road in the House, but it will eventually be passed," AFIPS's Clement says. "Senator Nunn is in a position of great power, and if he really wants it, he'll get it."

Joseph E. Collins, manager of governmental affairs for the Data Processing Management Association (DPMA) in Park Ridge, Ill., says he agrees that the commission bill will pass in 1987 and notes that DPMA will focus its lobbying efforts to support it.

Although Clement and Collins foresee passage of the bill — partly because it would not cost the government any money — there are opponents who view the commission as unnecessary. "I think there are people against an Information Age commission fundamentally, and there are people who are just bored with the idea of another commission," Clement says.

The 23 members of the proposed commission would study such Information Age issues as employment, innovation, competitiveness, national defense and privacy.

Privacy issues are expected to get direct legislative attention in 1987 when Sen. William S. Cohen (R-Maine) reintroduces a bill called the Computer Matching and Privacy Protection Act. The legislation is designed to protect the privacy of citizens whose computerized records are cross-checked by government agencies [CW, Sept. 22].

Cohen says that government use of computer matching has tripled since 1980, but citizens are rarely notified and have little chance to correct the data. His bill would establish procedural and notification rules for computer matching and create Data Integrity Boards to oversee computer matching programs.

The bill is supported by the American Civil Liberties Union and the American Bar Association, but the Reagan administration opposes it on grounds that it would hamper the use of computer matching to catch fraud and abuse in government aid programs.

International competitiveness

A slew of think tanks and councils to study U.S. business competitiveness in the world economy

The Council on Competitiveness. Founded by Hewlett-Packard Co. President John Young and assisted by the National Association of Manufacturers. Council will try to implement the recommendations of the President's Commission on Industrial Competitiveness, chaired by Young.

The Congressional Caucus on Competitiveness. More than 100 Senate and House members intend to develop and pass "pro-competitiveness" legislation.

The Congressional Economic Leadership Institute. Launched by Pat Choate, a futurist with TRW, Inc. and author of the book, *The High-Flex Society*. Will analyze legislative proposals and help the Congressional Caucus (above) enact its program.

American Electronics Association is establishing a blue-ribbon industry task force, chaired by former Congressman Ed Zschau, to produce an agenda for the electronics industry's renaissance.

Information provided by American Electronics Association's "Update" newsletter, December 1986.

TRENDSETTERS

Fitting human expertise into a box is the puzzle of building a knowledge base, and the desktop box is still often too small. But Renee Barling, project director of Applied Artificial Intelligence at the Equitable Life Assurance Society of the United States, looks forward to a new year that will bring more practical applications from her research as well as downsized implementations.

1986 was a year of experimentation, but 1987 will see working models in the office environment, Barling says. She looks forward to more powerful, Intel Corp. 80386-based microcomputers that will have the memory and power to be a development tool. "Now, we separate the environment from delivery," she says. "The idea is to get it on conventional hardware. But with 1987 and the 80386, I think we'll be able to deliver."

Barling's team of three developers work on dedicated AI workstations, including the Texas Instruments, Inc. Explorer and Symbolics, Inc. systems. All design work has been in LISP, much of it using Inference Corp.'s Automated Reasoning Tool. "Our charter is to identify technology that appears to offer potential to solve business problems. We explore and experiment," Barling says.

Expert systems have been the team's focus, but Barling expects to explore other AI applications this year, particularly regarding development tools. Barling says she always focuses on the eventual user. "We don't get into the corner of the lab by ourselves," she says.

The user is the focus of Barling's own critical development guidelines, which are the following:

- "Make sure what you're automating will be used." Barling focuses on practical applications, especially with her group's charge of applied artificial intelligence.
- "Don't underestimate training." An expert system can change the way work is done, and the staff needs to understand how to use it.

Barling, a 13-year veteran of Equitable Life development, says she approaches AI as another new, capable development technique.

"To me, it's just software development," using AI technology as another of the new techniques that have appeared in recent years, she says. "It's not magic. The machine only does what you tell it to do."

P. W.

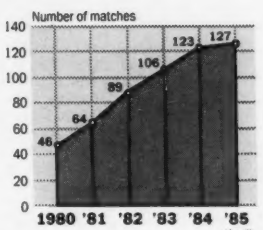
Policy issues worth watching

A few more policy issues to watch for this year:

- U.S. District Judge Harold H. Greene is expected to have made a decision by Labor Day as to whether the divested Bell operating companies can enter the equipment manufacturing, information service or long-distance network businesses. Analysts predict the operating companies will get the green light for manufacturing.
- The Occupational Safety and Health Administration has promised to respond to union complaints about "killer robots." The administration may require lock-out devices that shut down computer-controlled machinery, in the interest of protecting humans.
- The Data Processing Management Association will be lobbying state legislatures to strengthen their state computer crime laws and to prevent regulation of VDT usage.

Computer matching

Federal agency activity 1980-April 1985



Information provided by: "Electronic Record Systems and Individual Privacy," U.S. Congress' Office of Technology Assessment, June 1986.

- The American Civil Liberties Union hopes that the House Government Operations Committee will review the Pentagon's effort to restrict access to on-line data bases and government information.

M. B.

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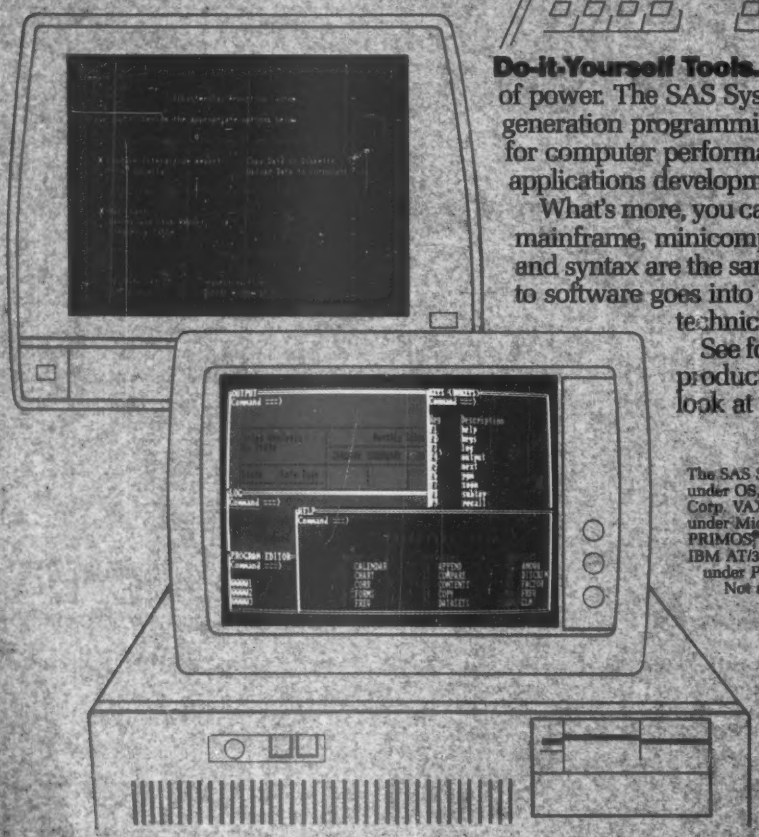

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MICROCOMPUTERS

MICRO BITS
William Zachmann

Inexpensive peace of mind

It is getting so that only those users with little influence in a company have to use personal computers without a hard disk. With prices typically less than $20 per megabyte on Winchester drives, and as low as $12 to $15 for careful shoppers, rigid disks are no longer a luxury item.

The only disadvantage of hard disks is that they sometimes go bad. When they do, some or all of the data on the disk may be lost. That is about the most unpleasant experience a user of a personal computer can have.

Having a backup copy of files on a hard disk can make the difference between a mere inconvenience and a major disaster in the event of a disk crash. But hard-disk backup that is inexpensive, convenient and fast hasn't come easily.

Cassette tape drives offer a relatively fast, high-capacity hard-disk backup option, but they have always been rather expensive.

Backing up hard disk systems to floppy disks is much less expensive, since no additional hardware is required. However, it has typically been very slow, and many users go without any backup at all, at least until their first hard-disk disaster.

New Orleans-based Fifth General Systems offers Fastback at a suggested retail price of $179, which provides a convenient and remarkably fast hard-to-floppy disk backup capability. If you are quick-fingered, you can back up a full 20M-byte IBM Personal Computer

See **INEXPENSIVE** page 72

Zachmann is vice-president of research at International Data Corp.

Apple improvements to be highlighted at Macworld

By Peggy Watt

CUPERTINO, Calif. — The communications capabilities that Apple Computer, Inc. has promised for its Macintosh personal computer should surface this year, although few will be ready for the Macworld exposition in San Francisco this week.

Industry analysts who have seen the system say Novell, Inc. in Orem, Utah, will soon unveil Appletalk capabilities for its Netware network operating system, allowing Macintosh computers to hook into that local-area network. Apple is said to be preparing a server, possibly with a multiuser data base designed by a French third party but sold under Apple's label. And a handful of third-party developers are readying or refining announced communications products and networking applications.

The products that will be shown this month, however, are primarily improvements on established themes. They include a Macintosh data base product from the Culver City, Calif.-based Nantucket Corp. that reads Ashton-Tate's Dbase files; The Adobe Illustrator, a sophisticated drawing program from Adobe Systems, Inc., in Palo Alto, Calif.; a multiuser accounting package from Los Angeles-based Monogram Systems; and an upgrade of existing products from Living Videotext in Mountain View, Calif.

Novell's Netware support of the Macintosh is expected in March, several analysts familiar with the product said. "An Appletalk interface will plug into a Netware server, probably an Ethernet one," said Robert Clark, vice-president of the Seybold Group, Inc.'s consulting division in San Jose, Calif. "Eventually, you'll be able to put IBM Personal Computers on Appletalk on the same wire as you have Macs."

See **SHOW** page 72

Some XT wholesale prices cut

Move said to clear way for low-end 8086-based PC

By David Bright

IBM has cut the wholesale prices of two IBM Personal Computer XT models by 42%, a move that observers said sets the stage for IBM's forthcoming low-end personal computer.

"This means that the new low-end 8086 machine is certainly coming soon," said Aaron Goldberg, vice-president of Microcomputer Services at International Data Corp., a Framingham, Mass.-based market research company. "This is definitely an inventory clearing move."

The wholesale price of an XT with one floppy disk drive fell from $1,287 to $750, and the price of a system with two floppy disk drives dropped from $1,377 to $800, an IBM spokesman said. IBM's single-unit prices for the two systems remain firm at $2,145 and $2,295, respectively, the spokesman added. The price reductions took effect Jan. 2.

Goldberg and many IBM watchers said the new Intel Corp. 8086-based system could debut by late January or early February.

Most observers said they expect the new machine to be targeted primarily at the educational and home markets.

Goldberg said the price would probably be in the $1,200 to $1,400 range. While that price is still considerably higher than many of the 'clones', the machine may come bundled with extras such as a Color Graphics Adapter and as much as 1M byte of on-board memory, according to Goldberg.

The price cuts follow reductions in IBM Personal Computer prices made last summer. IBM reduced dealer prices on selected PC models by as much as 18% in July 1986, and a month later cut the direct sales price of PC models by up to 22%.

NEW THIS WEEK

- Hayes enhances its Smartcomm II networking software

■ For more on this and other new products, see pp. 89-100.

INSTANT ANALYSIS

"It is not an official product in the sense that we have announced it or announced any dates."

— Bill Gates, Chairman of Microsoft Corp., on his firm's next-generation operating system that will exploit the power of the Intel Corp. 80286 processor

Advertisement

Oracle launches ALLIANCE program for software VARs

Oracle Corp,. supplier of the ORACLE distributed relational DBMS and application development tools, has announced a new program for software value-added relicensors dubbed the Oracle *Alliance* program. The program offers broader markets, simpler, faster selling cycles, and shorter time-to-market for VARs who build or convert their applications to use Oracle's products.

According to Larry Harman, Oracle's Director of the VAR program, "We offer major business benefits to VARs who choose to use ORACLE with their products. Chief among these benefits is ORACLE's portability and the portability of ORACLE-based applications, allowing applications and data to be shared among different machines. Oracle also provides the link software to exchange database information among the different machines."

Broader VAR Markets

ORACLE runs on the widest array of hardware: IBM mainframes under MVS and VM, most vendors' minis under both proprietary and UNIX operating systems, and PCs under MS/DOS. Oracle also developed SQL/RT, marketed by IBM on the RT PC.

Harman states, "Only with ORACLE can an application developer produce software on one system and *inherit* a vast market of users of multiple vendors' hardware. Basically, we let our software VARs do *blindfold selling*."

"Blindfold Selling"

The company described "blindfold selling" as the ability of a VAR's salesman to walk into an end-user site blindfolded and say, "I don't know what types of hardware you're using, or how many types there are, but my applications run on all of them."

Harman points out that VARs have a tough decision to make concerning what hardware to implement on. With ORACLE, that decision needn't be made. Software VARs who establish a niche in a particular vendor's install base can take advantage of ORACLE's portability to sell in other hardware environments.

Shorter Time To Market

The company also cited the high level of productivity offered to VARs by Oracle's broad range of application tools, including a forms system, integrated spreadsheet, graphics and other tools. These yield development and maintenance efficiencies that translate into shorter time-to-market and lower costs.

And, Harman adds, "ORACLE is the most complete and mature SQL-based DBMS on the market. SQL is becoming a national standard, so developing applications with an IBM-compatible, portable DBMS makes business sense in both private-sector and public-sector markets."

Harman concludes, "Generous discounts plus support, training and co-marketing combine to make the Alliance program an outstanding opportunity for software VARs."

Advertisement

Oracle Corporation, founded in 1977, builds and markets the ORACLE distributed relational DBMS, 4GL and DSS tools. ORACLE was the first commercial SQL-language DBMS, and is compatible with IBM's DB2 and SQL/DS DBMSs.

ORACLE provides a standard software environment across a wide range of computers and operating systems, including IBM mainframes, minicomputers from DEC, DG, ATT, HP, Stratus, IBM, Apollo and many others, and IBM PCs. ORACLE runs with IBM's MVS and VM/CMS, DEC's VAX/VMS and DG's AOS/VS among others, as well as with UNIX on most systems.

All versions of ORACLE, from the mainframe to the PC implementation, are identical. ORACLE is the only relational DBMS which provides the complete portability of data and applications across a wide variety of systems. Oracle's SQL*Star architecture links dissimilar systems running ORACLE.

Oracle Corporation markets its products worldwide through 30 direct sales offices, 11 distributors and the Authorized Oracle Dealer network. In addition, ORACLE is sold by numerous hardware manufacturers, including IBM, Honeywell, Sperry, Stratus and Prime.

ORACLE®

Compatibility • Portability • Connectability

For additional information, contact Larry Harman, Director, VAR Marketing, Oracle Corporation, 20 Davis Drive, Belmont, CA 94002 or call 800-345-DBMS.

Inexpensive peace of mind

From page 71

AT disk onto 14 1.2M-byte floppy diskettes in about eight minutes.

My rather eccentrically configured IBM Personal Computer, with a Microsoft Corp. Mach 10 board and a Plus Development Corp. Hardcard 20, was slower. It took 27 minutes and 49 seconds to copy 12,130,304 bytes in 632 files to 31 standard 360K-byte floppies. Still, that's pretty good, since almost five minutes of that time the program was waiting for me to find and insert another diskette. In addition, I used unformatted diskettes.

Prior to Version 5.13, Fastback was copy protected, which was a characteristic that kept the program off my list of software to take seriously.

With the newest version, however, Fifth Generation Systems has responded to similar sentiments from customers and released the program unencumbered by copy protection.

Fastback is straightforward and easy both to install and to use. The backup program can be used to back up an entire disk, selected directories and/or files or simply those files that have been changed since the last backup. By backing up only those files that have changed since the last backup, the typical user will be able to reduce backup time to only a few minutes a day.

A catalog of the backup diskettes and their contents is kept on the Fastback directory on your hard disk. This is very convenient in speeding selective backups and locating individual files you may want to restore. The restore program will identify the disk to be mounted. This is actually more convenient than tape backup systems in which the drive may have to wind through the tape to reach the file you want.

Although used for convenience, the hard-disk backup directory is not required. The restore program can also read directory information directly off the diskettes. If the hard disk is lost or if you want to restore to another system, Fastback uses the directory information on the backup diskettes.

Automatic format

Backup diskettes do not have to be formatted prior to use. Fastback automatically formats them as it does the backup. It uses a proprietary format to get more than the standard amount of information on a 360K- or 1.2M-byte floppy.

Fastback also includes error detection and correction routines that will repair up to one erroneous sector in each track of each side of the floppy disk. It is also possible to specify a 720K-byte format that allows for the use of less expensive standard diskettes on a high-density 1.2M-byte IBM PC AT-type floppy drive.

All things considered, I found Fastback to be an extremely useful option for hard-disk backup. Its speed and ease of use make Fastback well worth considering if you are concerned about hard disk backup. It delivers value and performance that compare favorably with more expensive backup alternatives.

The Seybold Group's Conference on

Desktop Communications

The Hyatt Regency
San Francisco
January 28–31, 1987

Information on key issues that will prepare the corporate decision maker to meet today's communication challenges.

Desktop communications has become a major area of financial commitment for companies of all sizes. The Seybold Group has developed panel discussions and seminars to present you with as much meaningful information as possible in as short a time as possible.

Topics

- Communication from desktop to mainframe — what are the options?
- Multiuser computer systems vs. local area networks — what's the right choice?
- Successes and failures in implementing LANs — a user's perspective.
- Desktop publishing — how does it fit within an office communications environment?
- Today's multiuser software — does it really meet user's requirements?
- Implementing workgroup networks — what are the real costs?
- Coaxial, twisted, fiber — how do you choose wiring media?
- The emerging role of departmental computers — what are the needs, what are the benefits?
- The future of office communications — an outlook from the industry's most experienced analysts.

Speakers

High-level executives from some of the industry's most prestigious companies will take part, including:

- John Sculley, Pres. and CEO, Apple Computer
- Joseph Gottfrid, Div. Mgr. Customer Serv. End-User Support, AT&T
- William Krause, Pres. and CEO, 3COM
- Dr. Robert Carberry, V.P. Product Line Management, IBM
- Max Toy, Sr. V.P. Marketing, ITT
- Craig Burton, V.P. Corp. Marketing, Novell

Along with such industry analysts as:

- Stewart Alsop, Editor, P.C. Letter
- David Bunnell, Publisher, PC World
- Jerry Pournell, Columnist, Author

Other companies that will be represented include:

- Ashton-Tate
- AST Research
- Convergent
- Corvus
- Data General
- DCA
- DEC
- Hewlett-Packard
- Lotus
- Microsoft
- Northern Telecom
- 3M
- Toshiba
- Wang
- Xerox
- . . . and others!

Product Announcements

A number of major companies involved in desktop communications have already indicated that they will be announcing significant new products in conjunction with the conference.

Registration Information

- Dates: January 28–31, 1987 (Wednesday, Thursday, Friday, and Saturday)
- Cost: Conference, $595. Hotel rooms available at specially discounted rates. Call the Hyatt Regency, (415) 788-1234, to make your hotel reservation. Be sure to indicate that you will be attending the Conference on Desktop Communications.
- **For additional details about the conference, please contact The Seybold Group. Phone (213) 320-9151 or (408) 297-0888.**

Exhibits

- Dates: January 29–31, 1987 (Thursday, Friday, and Saturday)
- Exhibits: Products needed to set up effective desktop communication workstations and networks. For information on exhibiting at the conference, contact The Seybold Group.
- Cost: Free for conference participants; $25 per day for nonparticipants.

Show to highlight Mac rollouts

From page 71

Even without an IBM PC connected to Appletalk, the system can have a network link with a Macintosh for file sharing by using a Netware bridge between networks, Clark said.

Mountain View, Calif.-based 3Com Corp., manufacturer of an Ethernet network for the Macintosh called Ethermac, was developing such a PC-Macintosh network for several months, Clark and other industry sources said.

"3Com thought they had an OEM marketing agreement with Apple," Clark said. Novell was willing to handle its own marketing as long as the company had Apple's assurance of compatibility, analysts said.

Apple will also show its own network product in January, Clark said. "They're sticking with Appletalk," he said. "The tendency is to bridge between systems. Everyone who wants to connect to the Macintosh has to use Appletalk protocols. The open Mac will allow more communications options, but what do you do with the other Macs out there? You still need Appletalk."

Dove Computers, in Wilmington, N.C., expects to release IBM Token-Ring and Starlan interfaces for Macintosh this year. Dove already produces a Macintosh Ethernet LAN that is compatible with Digital Equipment Corp.'s Decnet. "We have targeted the LAN area as wide open for the Macintosh," said President David Valliere. "It is also clear bridging micros to large mainframe networks is wide open."

The Nantucket product is a relational data base from the makers of Clipper, a Dbase work-alike compiler. Nantucket bought Dmac III from Format Software in San Diego, revamped the product and will rename it in time for shipment in February, said Edward Brassard, vice-president of product marketing. According to Brassard, it will be priced at less than $400.

The Adobe Illustrator, from the developers of the Postscript communications language, is intended as a professional graphic artist's tool and allows finer control of artwork because it does not use bit-mapped graphics, said President John Warnock.

COMMUNICATIONS

Rolm CBX II links to AT&T

By Stanley Gibson

SANTA CLARA, Calif. — Rolm Corp. announced last week that its CBX II 9000 had passed tests for compatibility with three AT&T Communications digital services: Accunet T1.5, Megacom and Megacom 800.

With the announcement, Rolm offers its customers access to AT&T digital services across its entire Computerized Branch Exchange (CBX) product line, according to Graham Chloupek, T1 product manager at Rolm.

"It's something they need to do. Most everyone else has done it. It makes connections to T1 easier by making them an inherent ability of the switch," said Doane Perry, a telecommunications analyst with International Data Corp. in Framingham, Mass.

"T1 and these other services have a variety of framing standards. AT&T keeps adding control overhead to the transmission for management. This raises the ante for customer premises equipment vendors. AT&T ratchets up what's involved in sending information over the pipe. If vendors want to sell, they have to watch AT&T's moves," Perry added.

Accunet T1.5 is a high-speed digital service that provides private line voice, data, facsimile or video transmission at a rate of 1.544M bit/sec. Megacom and Megacom 800 are digital services targeting business customers.

Compatibility with AT&T switching and framing protocols enables the CBX to interface directly with these services over a T1 special-access facilities link to the AT&T central office, according to Rolm.

"By connecting these T1 services to the CBX II 9000 instead of using other types of media, Rolm users have new opportunities to save money on their network transport costs," Chloupek said.

"The announcement is significant because Rolm is an IBM unit. Even IBM recognizes the need to interface with AT&T. It's almost a tactical issue," said Joaquin Gonzales, a telecommunications analyst with the Gartner Group, Inc. in Stamford, Conn.

The verification tests included transmitting voice from a Rolm CBX T1/D3 interface through multiple AT&T Digital Access and Cross-Connect Systems to ensure compatibility with AT&T's D4 framing convention for signaling, according to Rolm.

Rolm announced in March 1986 that its CBX 8000 had passed the same tests for interface compatibility.

Gateway joins 3+, SNADS

Users on network or host can exchange documents

By Elisabeth Horwitt

TORONTO — An electronic-mail gateway between 3Com Corp.'s 3+Mail and IBM's Personal Services/370 is likely to become commercially available in the first quarter of this year. The product will allow document exchange between users on 3Com's 3+ local-area network (LAN) products and users on IBM hosts running Systems Network Architecture Distribution Services (SNADS) and Distributed Office Support System (Disoss).

The product was jointly developed by 3Com and Toronto-based system integrator Linkage, Inc. at the request of Merrill Lynch Canada, Inc., which needed a "cost-effective way to integrate PCs with a Disoss backbone," explained 3Com product marketing manager Alan Kessler. "[Merrill Lynch] users have to receive their quote information on the mainframe, so the question is, do you install another mainframe to run PS/370? LANs are a much more cost-effective way to link the brokers who have to use dumb terminals and the mainframe with IBM PC users."

The gateway, which consists of software running on an IBM PC, automatically performs format and protocol conversion so that 3+Mail documents can be sent to PS/370 users. "We know the product works; we're just evaluating demand so we know who will offer it and how," Kessler said. "You have to recognize that different resellers have different levels of expertise when it comes to SNA products. If 3Com is going to put its name to a package and shrink-wrap it, we want to be sure customers will be satisfied if a computer store sells it without third-party support."

If the product proves too complex for retail outlets, 3Com will be "happy to have the product offered by Linkage with value added," Kessler said.

3Com and possibly Linkage are discussing profit-sharing terms with Merrill Lynch Canada, which currently owns the gateway. The investment firm will use the product to link work groups at multiple sites, some of which will be on 3Com's token-ring network, others on a corporate mainframe running PS/370, located at Toronto headquarters.

"Smoothly integrating local-area network technology is the key for companies with substantial investments in IBM host-

See **GATEWAY** page 74

MCI to upgrade digital services

By Elisabeth Horwitt

WASHINGTON, D.C. — Striving to remain competitive in the burgeoning high-speed digital services market, MCI Communications Corp. recently announced it would be lowering prices on and upgrading its Terrestrial Digital Service (TDS 1.5). MCI is also in the process of increasing the number of miles of microwave and fiber-optic lines that support the 1.5M bit/sec. offering, the company said.

The announcements were "part of MCI's strategy to remain competitive in the market in terms of quality, pricing and availability," stated MCI spokesman John Houser.

Effective Feb. 1, rates for TDS 1.5 connections over distances of 141 miles or more will decrease an average of 30% per circuit mile, according to Houser. Transmission rates for connections over distances of less than 141 miles will increase an average of 29% per circuit mile.

The pricing changes are designed "to keep our prices 10% lower than AT&T's," Houser noted.

Also effective Feb. 1, MCI will offer 3% discounts to customers with monthly bills equaling or exceeding $150,000 and 5% discounts to those with bills equaling or exceeding $300,000, Houser said. Term discounts for one-, three- and five-year contracts will also be offered.

As of Feb. 1, MCI will offer its customers the option of having their transmissions routed only over fiber-optic connections "where they are available," Houser said. No additional monthly charge will be levied for this option, but customers will pay a $400 one-term administration charge, he added.

The company made known its plans this year to increase its network of digital fiber-optic and microwave lines. At the end of 1986, the network covered approximately 32,000 route miles, 12,700 of which were digital. By the end of this year, the network will extend over 40,000 route miles, 50% of which will be digital, Houser said.

INSIDE

AT&T, Northwestern Bell to link Switched 56 services/**74**

FCC accounting method to replace structural separation for telephone companies/**74**

NEW THIS WEEK

- Control Data expands its Rediner electronic data interchange system
- For more on this and other new products, see pp. 89-100.

INSTANT ANALYSIS

"IBM says anything written for Netbios will run on Advanced Program-to-Program Communications, but how well can that work when APPC offers so much more functionality?"

— Steven Berto, project manager, office systems, Metropolitan Life and Affiliated Companies

T1 switches to gain DACS power and support subrates

By Stanley Gibson and Elisabeth Horwitt

The next two months will see several significant T1 switch introductions, particularly in the area of Digital Access and Cross-Connect System (DACS) compatibility and subrate digital multiplexing, industry sources say.

AT&T developed DACS as a central office device to route 64K bit/sec. DS0 transmissions among T1 lines. "What users need is smaller DACS switches that can also do subrate digital multiplexing" says William Rahe, vice-president of Enterprise Network Strategies at the Gartner Group, Inc., a research firm in Stamford, Conn. Subrate digital multiplexing (SDM) allows a 64K bit/sec. DS0 channel to be broken up into smaller bandwidths so multiple transmissions can share the same DS0 link.

At Communications Network '87, in February, Tellabs, Inc. will unveil its long-awaited DACS customer-premise switch, analysts predict. A Tellabs spokesman told *Computerworld* that the company would announce a DACS-compatible switch at the industry conference and that AT&T would be the OEM for the product.

It is very likely that the switch will also perform subrate digital multiplexing, Rahe notes. Several of Tellabs' major competitors also claim to be working on DACS-compatible switches with SDM, he adds.

Later this month, Avanti Communications Corp. in Newport, R.I., will introduce a "high-end T1 multiplexer that significantly boosts port capacity, intelligence, routing and network management capabilities" compared with the vendor's previous products, according to Avanti spokesman William Geasey.

Avanti would not confirm or deny that the product would also feature SDM, but the Gartner Group's Rahe says it is likely. Approximately 22 T1 multiplexer vendors already offer the capability. Timeplex will begin shipping its Link/2 DACS-compatible multiplexer in mid-January, having successfully completed beta testing, an industry source told *Computerworld*. Timeplex announced SDM capabilities for its switch last fall.

AT&T Switched 56 gets local access

By Elisabeth Horwitt

WASHINGTON, D.C. — AT&T has proposed a revised tariff that enables users to access its Accunet Switched 56 through similar services offered locally by divested Bell operating companies. This will enable customers to cut local loop costs by more than 80% for the digital 56K bit/sec. service, according to AT&T.

Right now, approximately 90% of Switched 56 customers use AT&T's Dataphone Digital Service (DDS) to move data from their premises to the nearest AT&T central office, according to Switched 56 Service Marketing Manager Martha Churchill. The revised tariff will allow them to replace this $700 per month dedicated service with a local telephone company's Switched 56 offering, which costs approximately $120 per month, according to Churchill.

Linking local and long-distance Switched 56 services also enables users to send both voice and data over the same lines, Churchill noted.

If the revision is approved by the Federal Communications Commission, the new access service will become available on Feb. 6, 1987, to customers originating digital calls at Northwestern Bell's central offices in Minneapolis and Omaha. While several divested Bell operating companies offer Switched 56 services within their regions, last October Northwestern Bell became the first company to win FCC approval for Switched 56 services with access to long-distance services.

Other divested Bell operating companies have filed similar tariffs with the FCC and expect approval by the second quarter of this year, according to Northwestern Bell spokesman James Atkinson.

"We've been anxiously waiting for the local companies to file inter-LATA [local access and transport data] services so that we could file our half," Churchill said.

FCC ends structural split

By Elisabeth Horwitt

WASHINGTON, D.C. — The Federal Communications Commission recently approved an accounting method that will finally eliminate the existing structural separation of regulated and nonregulated businesses within AT&T and the divested Bell operating companies.

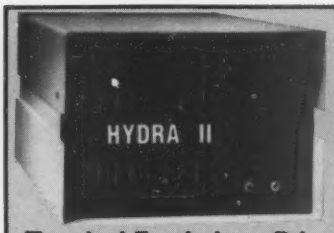
While some telephone companies' nonregulated activities "do not now involve the regulated network plant, we want to ensure for the future that nonregulated activities bear their fair burden of a company's investment," FCC staff attorney Jane Jackson said. "A lot of companies are buying equipment now for future unregulated use."

The accounting method is "designed to be a standard approach that involves the maximum amount of direct assignment of costs" to either the nonregulated or regulated side of a carrier's business, Jackson said.

Telephone companies will have to estimate in advance what percentage of a given piece of equipment will ultimately be used for regulated and nonregulated business, Jackson noted. "If equipment is to be used, say, 20% for nonregulated services during the first year, you assign 20% of operating costs plus investment costs."

Companies' estimates of future revenue also become a basis for dividing costs among regulated and nonregulated services, according to Jackson. "If the nonregulated activity doesn't pan out, they take their lumps," she noted.

Tracking usage property item by property item will not be easy, Jackson admitted, "since intelligent switches are multifunctional and it's hard to say which does which." The new system will incorporate a corrective mechanism for inaccurate usage or revenue estimates that will involve rebates to customers where appropriate, Jackson said.



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Technical Support Manager
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HYDRA

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Dwight Ayle, Sr. Instruction Programmer Analyst
Mt. San Antonio College

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Data Processing Director
R.M.S.A.

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Vitalink announces bridge for 802 line

By Peggy Watt

MOUNTAIN VIEW, Calif. — Vitalink Communications Corp. recently announced a low-end bridge product for its network-to-network 802 WAN line.

The Translan IV is intended as an entry-level bridge for connecting only two networks or hosts and has only one synchronous port and a V.35 interface, according to Paul Schaller, vice-president of marketing and sales for Vitalink.

"We've had requests from people who want an entry-level product, who are getting into their first work group location outside their computer center but who want a gateway into their local-area network," Schaller said.

Vitalink's Translan line of bridge products provides communications between devices on geographically separated Ethernet 802.3 LANs. The bridges support either terrestrial or satellite connections at transmission speeds ranging from 9.6K to 2.043M bit/sec.

All Translan products handle transmissions at the link level. This enables them to transparently support a wide range of high-level networking protocols, including Digital Equipment Corp.'s Decnet, Xerox Network Systems from Xerox Corp. and Transmission Control Protocol/Internet Protocol.

"There's definitely a use for a low-end bridge as a backbone over T1," said Mark Freund, vice-president at Interconnect Network Consulting Group in Pasadena, Calif. "Many corporations have a lot of T1 lines. If you're running T1 speeds and can bridge over existing backbones, that's a lot less expensive than leasing another line," Freund said.

Unlike the Translan II and III, which have multiple ports, the Translan IV is not able to be upgraded. "We suspect as customers grow their networks they'll replace the Translan IV with a Translan III and move the IV to another location for a while," Schaller said. The Translan IV can be connected with the Translan II or III.

Gateway joins 3+, SNADS

From page 73

based applications," said K. Garry Rasmussen, the company's chief administrative officer.

Linkage has been working on Merrill Lynch's communications system for two years. The integrator chose 3Com as the LAN vendor because the 3+ network "has many necessary features like global naming service and an integrated store-and-forward mail system," explained Linkage President Robert Jull.

Global naming enables users to address other users and resources on geographically distributed networks and servers.

SOFTWARE & SERVICES

Ask data base tool helps reduce errors in management

By Rosemary Hamilton

LOS ALTOS, Calif. — Ask Computer Systems, Inc. recently added to its suite of manufacturing management products with a module that serves as a separate data base for engineering revisions.

The purpose of a separate data base, called Manman/Engineer, is twofold, according to Ask Computer Systems spokesmen. It allows for bill-of-materials revisions to be made outside of Ask Computer Systems' Manman data base, thus reducing errors that often occur when multiple users are accessing one data base and changing data.

Unlike the current Ask Computer Systems software, Manman/Engineer has been designed to accept data from other vendors' computer-aided design (CAD) systems, a feature that more closely integrates the design and manufacturing process.

"Now we're more consistent with our engineering changes," said Robert Bechler, material planning manager at Sequent Computer Systems, Inc., a Manman/Engineer beta site.

According to Eric Roberts, an Ask Computer Systems product marketing manager, Manman/Engineer can be considered as a "sandbox data base," because users can play with data without impacting a company's official manufacturing data. Users can make copies of official bills of materials and then store and manipulate the data while in Manman/Engineer. Once changes have been approved, a bill of materials can be sent back to the materials requirements planning package, Manman/Mfg, as an offical revision.

The same process can be applied to data from other vendors' CAD systems. So far, successful file transfer has been made with both Mentor Graphics Corp. and Apollo Computer, Inc. CAD systems, according to Ask Computer Systems' Roberts.

Manman/Engineer runs on the Digital Equipment Corp. line of VAX minicomputers. Prices for the Manman/Engineer start at $16,000 for a DEC Microvax license and $23,000 for the high end of the VAX line.

Firm offers DASD Advisor

Boole & Babbage product incorporates expert system

By Charles Babcock

SUNNYVALE, Calif. — Boole & Babbage, Inc. is offering a mainframe direct-access storage device (DASD) management system, called DASD Advisor, that is said to incorporate an expert system.

DASD Advisor is an optional addition to Boole & Babbage's established DASD performance tool, DASD Response Manager.

The Advisor uses information gathered by the Response Manager to identify disk storage performance problems, analyze their causes and recommend corrective action in English-like reports, according to Dennis White, Boole & Babbage's director of marketing.

It analyzes performance data with the intent of identifying bottlenecks at the channel, control unit, head-of-string and device levels of the I/O subsystem. It then interprets the data to explain performance problems and recommend adjustments to improve them, White said.

For example, the Advisor consists of three analysis modes. System Balance Analysis mode presents a view of the I/O subsystem from the top down, examining the relative utilization of such devices as channels and control units.

The Workload Analysis option examines the problem volumes in the I/O subsystem that are tied to particular work loads.

Each module is activated from menus that present labeled options.

DASD Advisor will be available in May or June at a price between $20,000 and $30,000.

Boole & Babbage used an expert system shell from Aion Corp. in Palo Alto, Calif., to develop the Advisor. Its knowledge base has a set of intelligent editors and windowing interface and an editor that allows developers to custom-design a user interface for the finished expert system, White said.

Founded in 1967, the Sunnyvale, Calif., firm was an early entrant in the performance management field. It plans to issue a series of expert system-based Advisor tools that extend the capabilities of current Boole & Babbage tools in the IBM MVS, IMS, CICS and VM environments.

SOFTWARE NOTES

AT&T, Gould to sell Austec tools

Austec, Inc. has signed a licensing agreement with **AT&T** and **Gould, Inc.** under which those firms will sell Austec's line of networked Cobol software development tools, including Acenet, Acecobol, Acemenu and Acegen. Acenet is said to work like a virtual operating system, able to run on different hardware but showing the same operating system to Cobol applications, Austec spokesmen said. ■

Cortex Corp. in Waltham, Mass., has signed an agreement to put its applica-

See **NOTES** page 76

Global Software adds IBM DB2 tool

By Charles Babcock

DUXBURY, Mass. — Global Software, Inc. has announced a tool that uses an existing data dictionary to provide dictionary facilities to IBM's DB2.

The tool, called Silas, is an ISPF Dialogue Manager application that contains screens for the logical maintenance of data bases, tablespaces, tables, indexes and views in the Datamanager data dictionary, a product of MSP, Inc.

Silas permits an existing inventory of data element definitions in the dictionary to be browsed and selected as columns for DB2 tables, said Duncan G. Connall, president.

In addition, Silas is said to provide

See **GLOBAL** page 76

INSIDE

Candle announces a multiple-region CICS reporting package/**76**

NEW THIS WEEK

- Dynasoft offers integrated software system for IBM mainframes

■ For more on this and other new products, see pp. 89-100.

INSTANT ANALYSIS

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Global Software adds DB2 tool

From page 75

for the generation of Create, Alter, Drop, Grant, Revoke, Label On and Comment On statements in DB2 and documents them in the data dictionary.

Equivalent statements may be generated for SQL/DS, the relational data base management system used under IBM's VM and DOS/VSE operating systems.

The Datamanager data dictionary provides cross referencing and structure generation capabilities via Silas, Global spokesmen said.

Definition and maintenance

By using Silas screens, DB2 data bases can be defined and maintained, Connall claimed.

Silas is available at a price ranging from $8,000 to $30,500, running under TSO or VM/CMS.

Silas is available as either a standalone product or as an option that has the capability to run with Global's Hugo/ISPF product.

MSA offers integrator

ATLANTA — An application that is said to provide the ability to integrate a set of financial applications and act as a "traffic cop" in their interchange of data has been announced by Management Science America, Inc (MSA).

Called the Financial Controller, it uses MSA's fourth-generation Information Expert system to provide an integration environment for applications. The applications may be MSA financial packages, in-house applications or third-party systems, said Larry Smart, MSA senior vice-president.

Financial Controller is in beta-test at Bankers Trust Co. in New York and will be available in the first quarter of this year, MSA spokesmen said. It will cost new customers $25,000; existing MSA financial applications users will receive the product free. The software makes it easier to integrate new applications with existing ones, spokesmen said.

Notes: Codasyl seeks members

From page 75

tion development tools on the **NCR Corp.** Tower, ITX 9000 and VRX/E 9800 minicomputers.

Known as Corvision and the Application Factory, they were originally developed for the Digital Equipment Corp. VAX. They have the ability to automate generating applications from a special diagram to production Cobol.

■

Additional members are being sought for a **Codasyl** committee. The committee's proposed function is to recommend a screen management standard to be adopted for third- and fourth-generation languages.

The standard will specify a simple interface for applications and an Independent Screen Description Language that describes interaction with both applications and devices, such as terminals, workstations and personal computers.

Interested parties are invited to contact Dan Frantz at Digital Equipment Corp., ZK02-3/R56, 110 Spit Brook Road, Nashua, N.H. 03062, or call (603) 881-2272.

■

IBM World Trade Corp. and **Automated Language Processing Systems, Inc.** (ALP Systems) in Provo, Utah, have signed an agreement under which ALP Systems will provide a computer-aided foreign language translation system.

The first translation system, which is due next summer, translates English to Japanese; later systems will translate English into Chinese and Korean, ALP spokesmen said. The systems run on IBM 5550 terminals under VM/CMS.

■

The **American National Standards Institute** (ANSI) has published an updated edition of ASCII standard codes. ANSI X3.4-1986 revises the 1977 edition of the 7-bit coded character set.

Some names of ASCII characters have been changed to reduce ambiguity.

For example, "Opening" and "closing" have been replaced with "left" and "right" when referring to parentheses, brackets and braces, for example.

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Candle Corp. announces CICS reporting package

By Eddy Goldberg

LOS ANGELES — Candle Corp. is expected to make available the Background Reporting Facility for IBM CICS/MVS environments in the second quarter of this year. The product will enable users to report on the performance of transactions across multiple CICS regions, as well as across different machines.

Candle also recently announced the immediate release of its Omegamon/VM software, XA/SF Version 300, for monitoring the performance of IBM's VM/XA/SF operating system.

Now in beta test, the Background Reporting Facility is the first CICS monitoring product to allow reporting across multiple regions, according to Theodore J. Marr, marketing vice-president at Candle.

The Background Reporting Facility, which will work with all IBM-supported CICS releases, collects performance activity that is used to form a data base on system activity. The data is stored in an external address space.

A utility is included to convert the background reporting data to IBM's CICS Monitoring Facility (CMF), allowing users to run existing CMF reports and feed the performance data bases, Candle spokesmen said.

The Background Reporting Facility, an Omegamon/CICS add-on product, will cost $6,000 for the MVS version and $2,000 for the DOS version, which is scheduled for summer 1987.

New features include a facility for performance comparisons to identify long-term peaks and averages in resource utilization during an Omegamon/VM session. It also includes a feature to analyze how users affect a specific mini-disk, which can be used for I/O load balancing.

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SYSTEMS & PERIPHERALS

HARD TALK
James Connolly

Planners juggle tech and talk

The growing number of capacity planners in U.S. data processing operations face a dual set of challenges, and about 2,000 of those managers tried to address their needs at a recent conference.

First, the planners are confronted by technical issues; in essence, the need for tools to measure performance and predict growth. Capacity planners at CMG '86, the international meeting of the Computer Measurement Group, Inc., seemed confident, however, that vendors are trying to address those technical issues, even if the attendees were disappointed by the lack of progress in the development of some tools, such as an all-purpose capacity planning expert system.

The second challenge, which is tougher to deal with, is the management issue. This is an area where every capacity planner in every corporation faces different problems because the role of this new breed of manager can vary widely.

It was strange listening to the comments of the different capacity planners as they described their groups' activities. It became increasingly clear there is no typical capacity planning group. The planners' roles range from iron-fisted control of hardware and software acquisitions to statistics gathering for special projects that never get off the ground.

It also became apparent that too many capacity planners are unsure of their own status in their companies.

See **PLANNERS** page 80

Connolly is Computerworld's *senior editor, systems & peripherals.*

Wang, HP flex muscles

Minis edging out IBM in mainframe locations

By Stanley Gibson

LA JOLLA, Calif. — Flexing their muscles in departmental computing, Wang Laboratories, Inc.'s Wang VS and Hewlett-Packard Co.'s HP 3000 minicomputer lines are making inroads on IBM's System/36 and 38 in IBM mainframe shops, a recent study shows.

The study, released by Computer Intelligence Corp., shows that 78% of System/36 sales and 86% of System/38 sales are to small business sites. But only 7% of System/36 and 7% of System/38 sales are to IBM mainframe sites.

In contrast, 62% of HP 3000 sales and 59% of Wang VS sales are to small business sites, while 16% of HP 3000 and 23% of Wang VS sales are to IBM mainframe sites.

Overall, the study shows installations of the HP 3000, the System/38 and the Wang VS increasing at similarly modest rates, the discontinued IBM System/34 population declining sharply and installations of the System/36 increasing rapidly.

The report also finds that IBM systems have considerably more direct-access storage device (DASD) capacity than the HP or Wang systems. Heavier use of data base management systems by the IBM users was offered as a possible explanation of the difference in average DASD capacity. The report's authors speculated, however, that new DBMS offerings from HP and Wang would likely narrow the gap.

In addition, the average DASD capacity for the System/38 stayed approximately the same from 1985 to 1986. Lower cost per megabyte DASD drives, however, might bring increased capacity to those systems in the coming year, the report's

See **WANG** page 80

Floating Point to supply DEC with M64 processors

By James Connolly

BEAVERTON, Ore. — Floating Point Systems, Inc. last week announced it will be supplying its M64 attached processors to Digital Equipment Corp. for packaging with DEC VAX systems and for sale to customers in the scientific and engineering fields.

In a separate announcement, Floating Point released annual financial results showing a loss of $14.2 million for the year ending Oct. 31, 1986, on revenue on $88.5 million, down from $126.5 million in revenue in 1985 (see story page 81).

Floating Point officials said the DEC agreement is an extension of an existing joint marketing agreement, under which Floating Point targets DEC installations for its products. Those officials declined to

See **FLOATING** page 80

Board connects 386, VMEbus

By Stanley Gibson

LOS GATOS, Calif. — Force Computers, Inc. recently announced the CPU-386, a board that brings the Intel Corp. 80386 chip to computers using the VMEbus.

The manufacturer claims that the CPU-386 is the first such board for the general market.

"We see it as an ideal marriage," said Wayne Fischer, director of marketing of Force Computers, referring to the chip and bus combination.

Although the board cannot run software written for Microsoft Corp. MS-DOS or Unix operating systems at present, it will be able to in the third quarter of this year, according to Fischer. This month, the system will be able to run programs written for the VRTX operating system from Ready Systems, formerly known as Hunter & Ready, Inc., Fischer said. "This first step

See **BOARD** page 80

NEW THIS WEEK

- Synercom Technology introduces its Distributed VS Station for mapping information management

For more on this and other new products, see pp. 89-100.

INSTANT ANALYSIS

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Planners juggle tech and talk

From page 79

Too many were unable to define their companies' commitments to capacity planning. It is a relatively new field and one that may be of little interest to companies that can afford to add computing power at leisure. However, those companies are becoming more rare.

The burden of building a successful capacity planning operation rests not only with the company, which has to recognize its measurement and planning needs, but also with the capacity planners who need to make themselves valuable. To make themselves assets rather than liabilities, those planners must help their companies and user departments manage their growth and resources.

It is disconcerting to hear managers talk only in numbers — in CPU benchmarks or disk packs — that their superiors or users often may not understand.

Finally, planners must listen to their users, not just concerning the applications or processors the users want but also regarding what the users hope to accomplish. Understanding the business plan is a key to success for capacity planners and MIS in general. Most capacity planners recognize this. However, the remaining handful sound remarkably like the old-line DP managers who hid behind glass walls while denying the need for user input and microcomputers. With luck, that more stubborn breed is the rare exception.

Wang, HP flex muscles

From page 79

authors indicated.

Another Computer Intelligence survey confirms a widely perceived trend that Digital Equipment Corp. is gaining an increased share of the market for commercial and general-purpose processors.

The arrival of new, more powerful DEC VAXs and increased use of clustering should help DEC break out of the scientific mold more and more, the report concludes. "More power means the ability to handle a wider array of system and application software — good news for vendors in the fast-growing DEC VAX market."

Floating Point to supply DEC

From page 79

specify the dollar value and length of the contract. However, they said DEC will introduce products based on the VAX-M64 combination. The introduction is expected sometime this month.

"The new products combine the strength of the two companies. DEC provides the industry's finest general-purpose engineering and scientific platform, as well as superb distributed and networked systems, while we offer the industry's most widely accepted compute-intensive processors," said George P. O'Leary, president of Floating Point.

Board connects 386, VMEbus

From page 79

is offering hardware. The second step is operating system and software," he said.

Once the operating system software is in place, the board will be able to execute the thousands of programs written for the Intel 8086, 8088 and 80286 chips at a faster rate. However, the full benefit of the 80386 chip can only be obtained from programs written especially for it, Fischer said.

"Now, there are a lot of cases where the application software doesn't run fast enough. The board offers considerable performance improvement for slightly greater cost," Fischer said. The board should gain acceptance in the military market, where the VMEbus is widely used, he added.

The CPU-386 is the first CPU board designed by Force Computers that is not based on the Motorola, Inc. 68000 family. Available in the middle of this month, the product will sell for $5,775.

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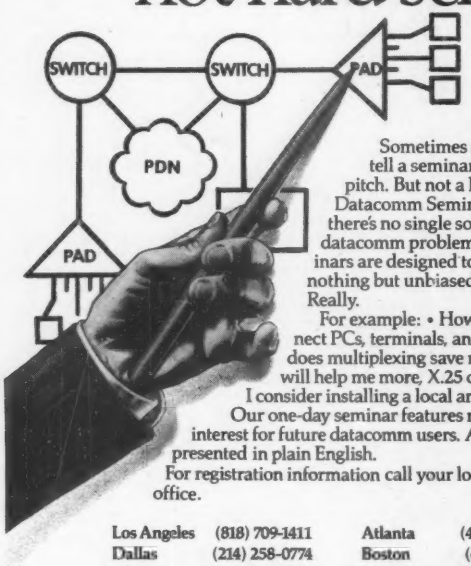

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COMPUTER INDUSTRY

OUTSIDE LINES
Bob Djurdjevic

3090s now face tougher ride

All those early-1986 doomsday preachers who talked of IBM's problems with 3090s because of their alleged lack of "functional differentiation" from the 3080 series will have to think again.

In fact, the 3090 program is off to a great start. According to July 1986 data from Computer Intelligence Corp., the 3090s' "if sold" shipment value in the U.S. was already exceeding that of all other IBM processors put together by a margin of 38% to 62%. As a result, IBM has been able to regain the large systems market share from the plug-compatible machines (PCM), which the company lost in 1985.

The significance of IBM's success with the 3090 during the first half of the year can best be judged by comparing it with another successful IBM product, the 4381.

As of July 1986, the 4381s accounted for about 49% of IBM's U.S. units installed. Meanwhile, the 3090s' share was only 7.6%. Measured in terms of market value, however, the 4381s contributed only 16% of IBM's total large systems installed base, while the 3090s accounted for more than 38%.

The two mainframe PCM vendors, Amdahl Corp. and National Advanced Systems Corp. (NAS), underwent a hiatus in shipments during the first half of 1986, owing to a change in product cycles. IBM, on the other hand, pro-

See **3090s** page 82

Djurdjevic is a computer industry analyst and president of Annex Research, a Phoenix-based computer research and consulting firm.

Loss expected at Wang

Fourth-quarter charges will also put Unisys in the red

By Alan Alper

LOWELL, Mass. — Subpar demand for its office automation products and mounting deficits at its Intecom, Inc. communications subsidiary will cause Wang Laboratories, Inc. to report a significant loss for its second fiscal quarter ended Dec. 31, 1986, sources close to the company said last week.

Another major vendor, Unisys Corp., which is the partnership of the former Burroughs Corp. and Sperry Corp., said last week that it will report a substantial loss in its fourth quarter, which ended Dec. 31, 1986.

The firm estimated it will take an after-tax charge of $250 million to $275 million due to layoffs, divestments, consolidation of operations and asset write-downs. Unisys earned $52.9 million in the third quarter — its first as the combined company.

Sources close to the company said Wang could report a loss of about $50 million for the second quarter of fiscal 1987. That result would follow a loss of $30 million in the first quarter, which was also said to be due to sluggish demand and poor performance by Intecom.

Second-quarter profit

In the second quarter of fiscal 1986, Wang reported a profit of $21.7 million.

The continuing financial difficulties at Wang fueled internal speculation last week that Harry Chou, vice-chairman and chief financial officer, is on the verge of resigning.

A Wang spokesman vigorously denied that Chou, an 18-year Wang veteran and confidant of company Founder and Chairman An Wang, had offered his resignation. He noted that rumors regarding Chou's departure were spawned after the executive left the firm last week to examine a vacation house.

Floating Point posts $14.5M loss

By Clinton Wilder

BEAVERTON, Ore. — Troubled scientific systems vendor Floating Point Systems, Inc. recently announced a slew of bad financial news, including a loss of $14.3 million, or $1.67 per share, for the fiscal year ended Oct. 31.

In fiscal 1985, Floating Point reported a profit of roughly the same amount — $14.4 million, or $1.75 per share. Fiscal 1986 revenue declined 30% to $88.6 million.

In addition, Floating Point said it was forced to reduce its previously reported revenue for the first three quarters by $6.2 million because of a change in revenue recognition.

In the past, the company recognized revenue when its products were shipped to customers, even though the customers had the right of return. Floating Point restated its results to recognize revenue at the time of customer acceptance.

Most of the year's red ink came in the fourth quarter, when the firm lost $12 million, or $1.39 per share, on revenue of $20 million.

Floating Point took a one-time charge of $4.1 million in the quarter to account for its loss from investing in financially struggling Lattice Semiconductor Corp. in Portland, Ore.

Reduction, underutilization

During the fiscal year, Floating Point also took charges of $8 million for inventory write-downs and $3 million for a 30% work force reduction and associated underutilization of factory capacity.

Lattice employees recently worked without pay for two months when the firm failed to complete an expected $10 million round of financing.

Lattice restored 50% of its payroll in early December after receiving funds from an undisclosed source.

INSIDE

Software AG announces 54% profit drop for quarter/**82**

Pansophic's buyout of SPSS gets canceled/**82**

INSTANT ANALYSIS

"Down the road, IBM will undoubtedly become a market force in microcomputer software. The growing reliance on departmental processing, networking and mainframe linkage will play right into Big Blue's hand."

— Gary P. Smaby, managing director, Piper, Jaffray & Hopwood, Inc.

Six IBM execs retire early

Vice-presidents take advantage of incentives

By Clinton Wilder

ARMONK, N.Y. — Two IBM senior vice-presidents and four vice-presidents announced their retirements during the company's recent three-month period to sign up for early retirement incentives.

Senior Vice-Presidents Dean P. Phypers and George B. Beitzel will retire. However, both men will retain their seats on IBM's board of directors.

Senior Vice-President and Group Executive Clarence B. Rogers Jr. was named to a position that consolidates his current post as head of the corporate services staff with Phypers' job, which entails heading the corporate operations staff.

Rogers will be responsible for 11 corporate staffs. These staffs include development, information systems and administration, manufacturing, marketing and service.

No replacement named yet

IBM has not yet named a replacement for Beitzel. Beitzel is senior vice-president of corporate business units.

The four retiring vice-presidents are Charles P. Biggar, who is president of the national service division; James F. Manning, assistant to Rolm Corp. President Dennis D. Paboojian; Ronald F. Casella, assistant group executive for software and business services, Information Systems Group; and P. Martin Foley, vice-president of information systems and administration.

J. Carl Masi named IDC CEO

By Clinton Wilder

FRAMINGHAM, Mass. — J. Carl Masi's nine-month search for a chief executive's position in the computer industry came to an end recently when he was named chairman and chief executive officer of the market research firm International Data Corp. (IDC), effective Jan. 1.

Masi, 45, a 12-year veteran of Wang Laboratories, Inc., resigned as Wang's sales and marketing executive vice-president last year.

Like former Wang President John Cunningham, Masi said he left Wang because of a desire to hold the top position in a computer firm.

Masi said his move from a $2 billion systems vendor to a privately held research services firm, whose annual revenue he estimated at $30 million, is not as unusual as it might appear.

"It's not the kind of move I thought I would have made nine months ago," Masi said. "But I looked at a number of different companies and traditional suppliers, and I just didn't find the opportunity that I have at IDC."

Masi compared the function of research services with the ultimate purpose of computer technology.

"IDC does not make a product that you can kick or plug into the wall," he said.

"But the real purpose is the same — providing the right information in the right form at the right time so users can make better business decisions," Masi added.

IDC is a subsidiary of International Data Group, which also owns CW Communications, Inc., publisher of *Computerworld* and other computer publications.

3090s now face tougher ride

From page 81

ceeded full steam ahead with the 3090s, trying to get as big a jump on the PCMs as possible.

How big a jump was it? In terms of the "if sold" shipment value list, IBM increased its market share to 92.3%; its market value share increased to 95.1%. The PCMs' share of the large systems market, on the other hand, declined to 5.4% for Amdahl and 2.3% for NAS. Their respective market value shares were 3.3% and 1.6%.

It would appear, therefore, that the scene is set for another big IBM surge in the large systems market.

Not so, however.

In the second half of 1986, IBM had to start *selling* the 3090s, rather than just taking orders. As pointed out after the original Sierra announcement, the first 500 to 1,000 large IBM systems were pretty well spoken for on the day of announcement. That's how well the Fortune 500-type companies listen when IBM speaks.

Unfortunately for IBM, however, most of the world is not made up of such giant industrial enterprises. The second-tier companies, in terms of size, tend to spend their money a little more prudently, which means tougher sledding for IBM.

Coupled with the increased availability of the PCM vendors' products, such a scenario will make 1987 an exciting year from the users' standpoint.

Software AG's profits fall 54%

RESTON, Va. — Software AG Systems, Inc. recently announced that its profits tumbled by 54% on a slim 4% rise in revenue for the second quarter ended Nov. 30, 1986.

The developer of mainframe data base management systems reported net income of $986,000, or 17 cents per share, compared with $2.1 million, or 36 cents per share, in the year-earlier quarter.

Software AG's six-month net income of $2.1 million is 58% below the comparable period a year earlier. President and Chief Executive Officer Stuart J. Miller said the firm is expected to report a profit decline in the fiscal year ending May 31.

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*Based on IBM price list as of April 2, 1986. Tandy 3000 HD price applies at Radio Shack Computer Centers and participating stores and dealers. Monitor, data terminals and XENIX sold separately. XENIX/Reg. TM Microsoft Corp. UNIX/TM AT&T. IBM PC/AT/Reg. TM International Business Machines Corp.

INDUSTRY NOTES

Pansophic-SPSS buyout canceled

Pansophic Systems, Inc. in Oak Brook, Ill., has broken off negotiations to acquire SPSS, Inc., the Chicago-based statistical analysis package producer. **David J. Eskra**, chief executive officer, issued no explanation of why the planned $32 million acquisition [CW, Nov. 10, 1986], announced at the end of October, failed to come off.

■

Uccel Corp. in Dallas has completed the acquisition of three companies for a total of $51 million. They are SKK, Inc. in Chicago, developer of the mainframe security software package ACF2, for $27 million; Cambridge Systems Group, Inc., in Santa Clara, Calif., which markets ACF2 and two related system-management products, for $21 million; and California Software, Inc. in Los Angeles, maker of Netman, an automated equipment ordering system, for $3 million.

Uccel spokesmen said the two larger acquisitions were made with bank borrowings and that the Dallas financial and systems software house still holds $100 million in cash and securities.

■

George W. Tamke, a 17-year IBM veteran, has been named president of **Cullinet Software, Inc.** Although Cullinet Vice-Chairman and Chief Executive Officer David Chapman had formally held the title of president, the office essentially had been vacant since the departure of Robert Goldman, who left to head Artificial Intelligence Corp.

Tamke's background in IBM mid-range systems is a sign of Westwood, Mass.-based Cullinet's direction away from the pure mainframe environment into software for minicomputers and departmental processors.

Tamke comes from IBM's Information Systems and Products Group, where he was assistant group executive for systems development and manufacturing. He will be responsible for Cullinet's sales and services divisions and will report to Chapman.

■

Intecom, Inc., the digital private branch exchange subsidiary of Wang Laboratories, Inc., recently laid off 180 employees. "The new merger with Wang enables us to utilize the parent company's capabilities and resources, thereby eliminating redundancies," Intecom President John Thibault said.

■

Apollo Computer, Inc. will make a more aggressive push into the personal computer computer-aided design market by selling its low-end engineering workstation, the Series 3000, through microcomputer dealers. Apollo which is working with authorized Autodesk, Inc. and Versacad Corp. dealers, is targeting users at companies with fewer than 1,000 employees.

MANAGEMENT

TAKING CHARGE
Alan E. Brill

Prevented maintenance

For years, articles and entire books have been written decrying the tremendous volume of resources devoted to the maintenance of applications software. The authors argue that the world would be a better place if only we could devote more of our energy to building new and better systems.

We are assured that through proper planning, we can move from an emergency (crisis) maintenance environment to a critical (but not panic) environment. Perhaps we can even get to a point at which maintenance is routine and untroubled or adopt the engineering concept of preventive maintenance.

I'm not going to claim that all of this is not good and desirable. I'm not going to argue that through good management, we can reach a point at which we think in preventive maintenance terms. I just think that if we look at preventive maintenance as our goal, we are being incredibly short-sighted.

Preventive maintenance is still actual work requiring the expenditure of actual resources. A better kind of maintenance — one requiring no expenditure of resources — would be maintenance that you were never called upon to perform, or, to coin a phrase, "prevented maintenance."

Consider an example:

Two companies in the same industry build payroll systems. Both work well. Late on the evening of Dec. 31, the managements of both companies sign their first collective bargaining agree-

See **PREVENTED** page 84

Brill is director of Computer Security Services for the New York City Department of Investigation.

GM opens electronic system

Payment program to be used at divisions, banks

By David A. Ludlum

In one of the more innovative thrusts of its development of electronic data interchange, General Motors Corp. plans to complete the launching of electronic payment for eight divisions through eight major banks this month.

Seven banks were on-line with electronic payment systems last month as planned, but one has "slipped into January," according to Benson Woo, GM's director of worldwide banking and U.S. cash management.

He declined to identify the bank. The eight banks are The Chase Manhattan Bank NA, Chemical Bank, Citibank NA, Pittsburgh National Bank, Manufacturers National Bank of Detroit, National Bank of Detroit, First National Bank of Chicago and Bank of America National Trust & Savings Association.

GM, aiming to become the first U.S. company to make electronic payments to all regular suppliers, is introducing the concept in stages after completing tests and a pilot project. "It is a controlled launch to make sure that everything works," Woo said.

The company's Electronic Data Systems Corp. subsidiary built a prototype system on a personal computer last year, finished a year-long pilot project with the First National Bank of Chicago in September and began operating a production IBM mainframe system in October, Woo said.

With the eight divisions on-line, GM expects to make electronic payments to about 300 suppliers. "We want to limit the number of suppliers to make sure everything works properly," Woo said.

The company may bring on the rest of the divisions and 20,000 regular suppliers this year. "Our intention is to go for all of them," Woo explained. "The timetables can be adjusted if necessary in order to make everyone feel comfortable. If it slips past 1987, that's not going to be a problem for us."

The payment system takes what Woo calls a "belt-and-suspenders" approach to

See **GM** page 88

Employees share in CIM start-up

By Rosemary Hamilton

Managing staff through the changes that computer-integrated manufacturing (CIM) brings can benefit from some familiar concepts, particularly the involvement of employees in the process, according to manufacturing executives.

"You've got to go out and ask for their help," said Raymond Grohoski, manager of engineering at the Bodine Corp. in Bridgeport, Conn. "You've got to make them feel important, because they really are important."

The methods proposed to break down the barriers and move people toward CIM vary widely, depending on the manufacturer. One manufacturer suggests psychological testing to ensure staffers are assigned the jobs that best suit their personalities. Other executives, however, say such procedures are unnecessary and basic good management is the key.

"To get employees to accept changes, you have to involve them," said William Rankin, manager of computer-aided manufacturing services at Deere & Co. "They share in the problems, so you have to let the individuals share in the solutions. They're the ones that are going to have to live with that."

Involvement at this Moline, Ill., plant primarily consists of quality circles and problem-solving work groups that are assembled with a mix of salaried and wage employees, Rankin said.

To ensure the success of such work groups, it is important to break down the barrier dividing the engineering and manufacturing departments, which have traditionally been at odds with each other. As Patrick Toole, an IBM vice-president and group executive, said during a speech at the Autofact '86 trade show: "The cultural

See **WORKERS** page 88

INSIDE

Calendar: Selected conferences, exhibitions, seminars/**86**

INSTANT ANALYSIS

"Everything to a CEO is staff."
— **John P. Imlay Jr., chairman, Management Science America, Inc.**

MANAGERS ON THE MOVE

Security Pacific Information Systems, Inc. (SPIS) in Denver will shift its focus from selling to other firms to supporting its parent company as recently appointed president and chief executive **Joseph E. McClure** takes over.

McClure was senior vice-president for computer services at SPIS, which he joined in 1984, the year Los Angeles bank holding company Security Pacific Corp. bought it from Baldwin-United Corp. McClure previously worked for Petro-Lewis Corp. and IBM.

He succeeds Michael Mitchell, who resigned to pursue outside business interests, McClure said. Security Pacific Corp. Vice-Chairman William Ford is chairman of SPIS.

In the past two years SPIS has concentrated on selling products and services to outside companies. Now it will focus more on Security Pacific subsidiaries, McClure said. It is negotiating the purchase of a system developed by Bank America Corp. and owned by Chrysler Financial Corp. that would link the 350 branch offices of Security Pacific Finance System Co.

Joseph E. McClure

SPIS products and services for outside customers include deposit and lending systems for savings and loan associations, a turnkey integrated system for small community banks, software for insurers and time-sharing.

SPIS will generate about $20 million in revenue next year, McClure said. A separate, larger subsidiary, Security Pacific Automation Co., supports Security Pacific banking activities.

■

Arthur S. Gloster II, formerly director of the Computing Services Center at Wayne State University in Detroit, has been appointed vice-president of information systems at **California Polytechnic State University** in San Luis Obispo, Calif.

■

The **Contel Government Systems** division of Contel Corp. in Fairfax, Va., has appointed **A. Steven Wolf** director of management information systems. He was an assistant vice-president of information services at M/A-COM, Inc. The division also appointed former program manager **David Tubesing** director of technical services for its Department of Defense Programs.

■

Joseph F. Traub, chairman of the Department of Computer Science at Columbia University, has been appointed president of the **Consortium for Scientific Computing**.

Traub, who has received a simultaneous appointment as professor of computer science at **Princeton University** in Princeton, N.J., succeeds **Dennis Jennings**, who served as interim president and has returned to University College of Dublin.

Traub's duties include planning, directing and managing activities of the $125 million John von Neumann Center for Scientific Computing.

Prevented maintenance

From page 83

ments with unions representing their workers. The agreements call for a pay increase of 4.683% on the first $15,000 of salary and a 3.277% increase on that portion above $15,000 but not more than $20,450.

At Company X, the DP and payroll departments go into an almost unimaginable panic. All days off and holidays are canceled. Drums of black coffee are rolled in to sober up the staff after New Year's Eve festivities. The objective is to change the pay records of each of the 4,750 people affected.

A quick meeting indicates that no one understands the payroll system. It was written by a person no longer with the company and, sadly, no longer among the living. Not only is there no documentation for the payroll system, but for key modules, there isn't even any current source code. Bottom line: there is no way they can make the salary changes in time by changing the programs.

As a result, the amount of salary change has to be manually calculated for each employee, a salary change transaction must be prepared and the files must be updated. Meanwhile, a crash project is undertaken to get the payroll system fixed up.

Meanwhile, at Company Z, the programmer-analyst with responsibility comes in on New Year's Day, as do the payroll supervisor and an internal auditor. Together, they put into the system a single password-protected group-update transaction that quickly recalculates everyone's salary, updates the record and provides a report to the payroll department and accounting and an audit trail report to the internal auditors.

The difference between the two companies is obvious. When Company Z built its system, it recognized that across-the-board raises were a possibility; Company X didn't.

Consider three additional cases:

- There's another bug hidden in Company X's payroll system. When it was built, the highest weekly pay was $600 per week. The analyst defined the file field of weekly pay to have three digits to the left of the decimal point. Next week, unbeknownst to DP, a new attorney is being hired. His salary will be $53,000. There's going to be another panic.
- To "save computer time," a mail-order processing system was built with the sales tax rates hard-coded into the programs for each state and city in the U.S. Any time a rate changes — generally, there is at least one change each week — the programmers modify the source code on the various programs, compile them, fix the bugs that appear, recompile them, unit-test them, relink them and test the system. Management can't understand why the turnover rate for maintenance programmers stands at 147% per year.
- To permit faster development of a desired new application program, a company eliminates quality assurance reviews and walk-throughs and performs as little testing as it can get away with. The system goes live, and within two weeks no fewer than 125 unsuspected bugs crop up, 51 of them major ones requiring immediate repair. The department goes into a maintenance frenzy from which it will not emerge for a long time.

In all three cases, the maintenance activities were preventable. In the first, the possibility of salary growth should have been obvious. In the second, the need to provide an efficient user-based rate-change mechanism should have been equally obvious. In the last case, for ignoring quality assurance, the company got what it deserved.

These examples and the earlier one help us focus our definition of prevented maintenance:

Prevented maintenance is (1) maintenance never needed because prudent problem analysis recognized the need for flexibility and the flexibility was provided for in the design or (2) maintenance that is not needed because quality assurance and testing techniques are used to assure that bugs that would cause panic maintenance are detected and corrected.

More succinctly, prevented maintenance is maintenance that you don't have to do because the system was designed not to need it. Thus, the keys to success in prevented maintenance are prudence and preplanning.

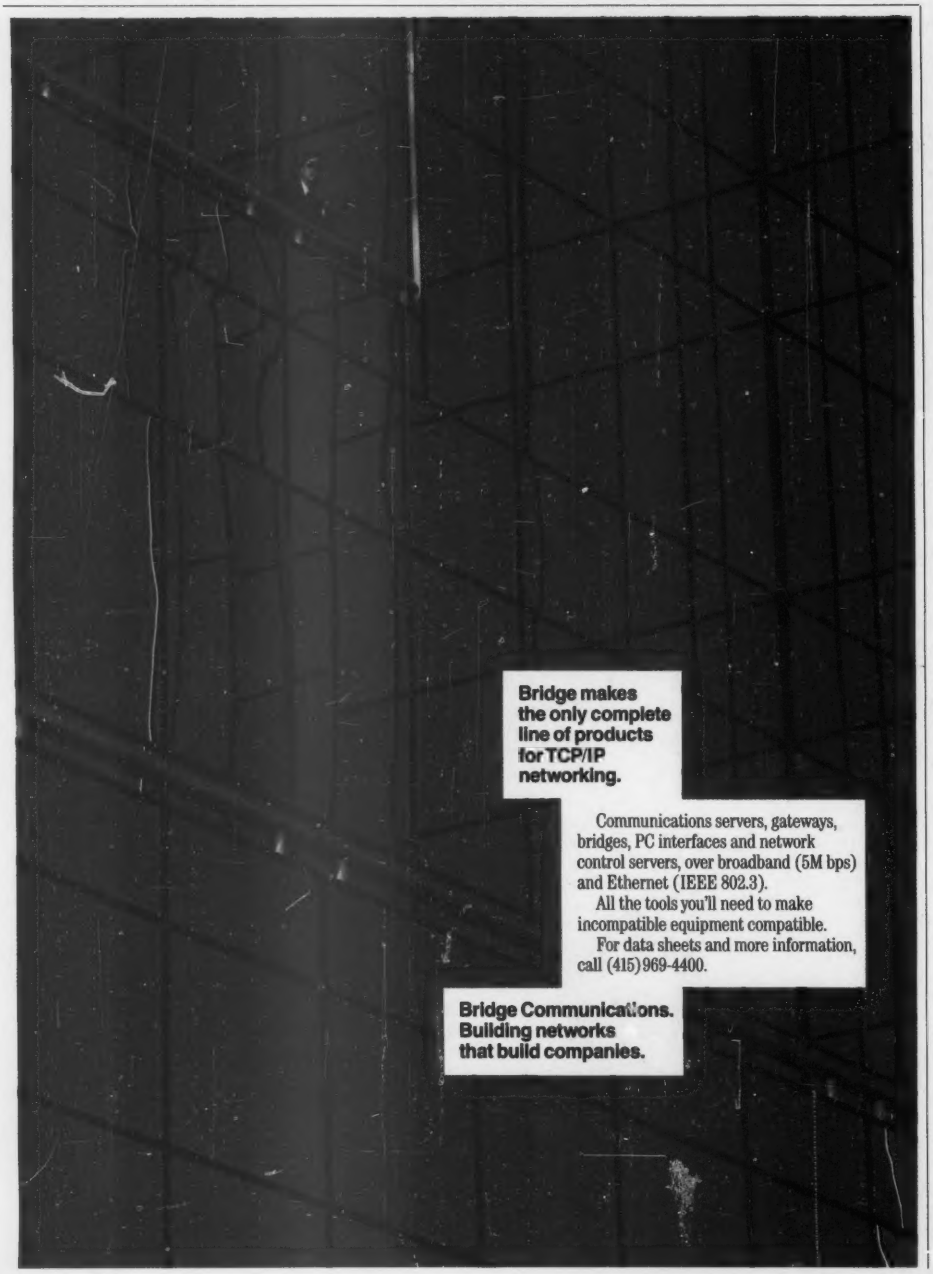
The major problem is the need to forecast system change. While there is no way to predict the system's future, there is a simple technique that will lead to reliable predictions. All you have to do is ask those who have some knowledge of the future requirements and environment:

Ask the users. Ask about current plans and business plans. Ask for their views on future changes in your industry as a whole. Ask about expected or possible changes in laws or regulations that might affect your system.

Ask the technical staff. Determine whether planned or predicted changes in hardware, packages or systems software are likely to impact your new application.

Ask yourself. Are you, for example, avoiding the temptation to hard-code variables rather than placing them in tables? If you have created tables, have you planned a controlled way for the tables to be maintained by the user? Have you actively evaluated the need for flexibility at every point in the system?

It isn't possible to eliminate all maintenance or even all emergency maintenance. But you can take action during systems development to avoid big investments in maintenance that is preventable.



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Applications Solutions	June 3	May 1	NCC
Software**	July 8	May 29	Siggraph
PC's	August 12	July 3	PC Expo
Communications	September 2	July 31	TCA & Info '87
Information Centers**	October 7	September 4	
PC's	November 4	October 2	Comdex/Fall
Software	December 2	October 30	Dexpo West

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CALENDAR

JANUARY 18-24

Pacific Telecommunications Council Ninth Annual Conference. Honolulu, Jan. 18-21 — Contact: PTC '87, Room 308, 1110 University Ave., Honolulu, Hawaii 96826.

Systems Engineering Workshop. Tampa Bay, Fla., Jan. 19-22 — Contact: M. Bryce & Associates, Inc., 777 Alderman Road, Palm Harbor, Fla. 33563.

Comlease Winter. New Orleans, Jan. 19-23 — Contact: The Information Exchange, 3825-I S. George Mason Drive, Falls Church, Va. 22041.

Buscon-West. Los Angeles, Jan. 20-21 — Contact: The Bus/Board Users Show & Conference, No. 116, 17100 Norwalk Blvd., Cerritos, Calif. 90701.

Companywide Disaster Recovery Planning. Los Angeles, Jan. 20-22 — Contact: Devlin Associates, Inc., 430 Exton Commons, Exton, Pa. 19341. Also being held March 24-26 in Philadelphia.

Uniforum. Washington, D.C., Jan. 20-23 — Contact: Suite 205, 2400 E. Devon Ave., Des Plaines, Ill. 60018.

Dbase III and Dbase III Plus. New York, Jan. 20-23 — Contact: Software Institute of America, Inc., 8 Windsor St., Andover, Mass. 01810. Also being held Feb. 9-12 in San Francisco and March 9-12 in Chicago.

Educational Seminar on T-1 Facilities and Networking. Dallas, Jan. 21-22 — Contact: Timeplex, Inc., 400 Chestnut Ridge Road, Woodcliff Lake, N.J. 07675.

Also being held Feb. 18-19 in Irvine, Calif. and March 18-19 in New Orleans.

Winter 1987 Technical Conference of the Usenix Association. Washington, D.C., Jan. 21-23 — Contact: P.O. Box 385, Sunset Beach, Calif. 90742.

The Open Network Architecture Concept. Washington, D.C., Jan. 22-23 — Contact: Telecom Publishing Group, Suite 444, 1101 King St., Alexandria, Va. 22314.

JANUARY 25-31

Entity Modeling: Techniques and Application. Chicago, Jan. 26-30 — Contact: Barnett Data Systems, 19 Orchard Way N., Rockville, Md. 20854.

Integrating Purchasing, Receiving and Accounts Payable Systems. Philadelphia, Jan. 26-30 — Contact: American Management Association, 135 W. 50th St., New York, N.Y. 10020.

Mapper Installation, Coordination and Support. Dallas, Jan. 26-30 — Contact: Compumetrics Training Institute, P.O. Box 58383, Houston, Texas 77258.

NCITD Informational Forum. New Orleans, Jan. 27 — Contact: Eugene A. Hemley, Executive Director, National Council on International Trade Documentation, Suite 1200, 350 Broadway, New York, N.Y. 10013.

Annual Conference on Improving Productivity in EDP System Development. Phoenix, Jan. 27-30 — Contact: Applied Computer Research, Inc., P.O. Box 9280, Phoenix, Ariz. 85068.

Computer Graphics New York '87. New York, Jan. 28-30 — Contact: Exhibition Marketing & Management, Inc., Suite 690, 8300 Greensboro Drive, McLean, Va. 22102.

Keeping U.S. Manufacturing Globally Competitive. San Diego, Jan. 28-30 — Contact: Robotic Industries Association, P.O. Box 3724, 900 Victors Way, Ann Arbor, Mich. 48106.

The Conference on Desktop Communications. San Francisco, Jan. 28-31 — Contact: The Seybold Group, Inc., 20695 Western Ave., Torrance, Calif. 90501.

Being More Profitable and Competitive with PC CAD/D. Sarasota, Fla., Jan. 30 — Contact: Maura Belliveau, Graphic Systems, Inc., 180 Franklin St., Cambridge, Mass. 02139.

FEBRUARY 1-7

1987 ABA Bank Telecommunications & Data Processing Workshop. San Diego, Feb. 1-4 — Contact: American Bankers Association, 1120 Connecticut Ave. N.W., Washington, D.C. 20036.

Instructional Computing Conference VII. Orlando, Fla., Feb. 2-5 — Contact: Florida Department of Education, Educational Technology Section, Knott Building, Tallahassee, Fla. 32399.

Third International Conference on Data Engineering. Los Angeles, Feb. 2-6 — Contact: The Computer Society of the Institute of Electrical and Electronics Engineers, Inc., 1730 Massachusetts Ave. N.W., Washington, D.C. 20036.

Automated Clean Room Processes. San Jose, Calif., Feb. 3-4 — Contact: Robotics International of Society of Manufacturing Engineers, One SME Drive, P.O. Box 930, Dearborn, Mich. 48121.

The Third International Conference on Data Engineering. Los Angeles, Feb. 3-5 — Contact: Professor Gio Wiederhold, Stanford University, Computer Science Department, Marguerite Jacks Hall, Palo Alto, Calif. 94305.

Digital Image Processing. Washington, D.C., Feb. 3-6 — Contact: Yolande Amundson, Manager, Education Services, P.O. Box 3614, 5800 Hannum Ave., Culver City, Calif. 90231.

Also being held Feb. 24-27 in Palo Alto, Calif., March 17-20 in Boston and March 24-27 in Washington, D.C.

Machine Vision and Image Recognition. Washington, D.C., Feb. 3-6 — Contact: Marilyn Martin, Education Services, P.O. Box 3614, 5800 Hannum Ave., Culver City, Calif. 90231.

Also being held Feb 10-13 in San Diego, March 10-13 in Anaheim, Calif. Will also be held from April 7-10 in Palo Alto, Calif., and April 21-24 in Washington, D.C.

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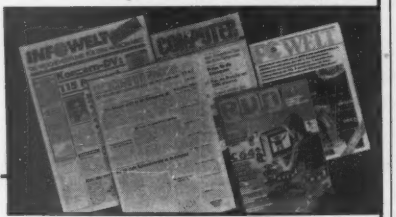

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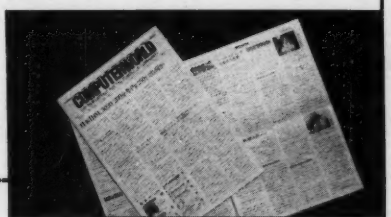

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We have created a limited edition, 20"x32" poster of the picture shown below. Printed in full-color, it includes an identification key to help you recall the memories you've forgotten. To get your poster, along with an information kit on museum membership, exhibits and activities, send a tax-deductible contribution of $25 or more to:

Memory Poster, The Computer Museum, 300 Congress Street, Museum Wharf, Boston MA 02210.

Please allow six weeks for delivery.

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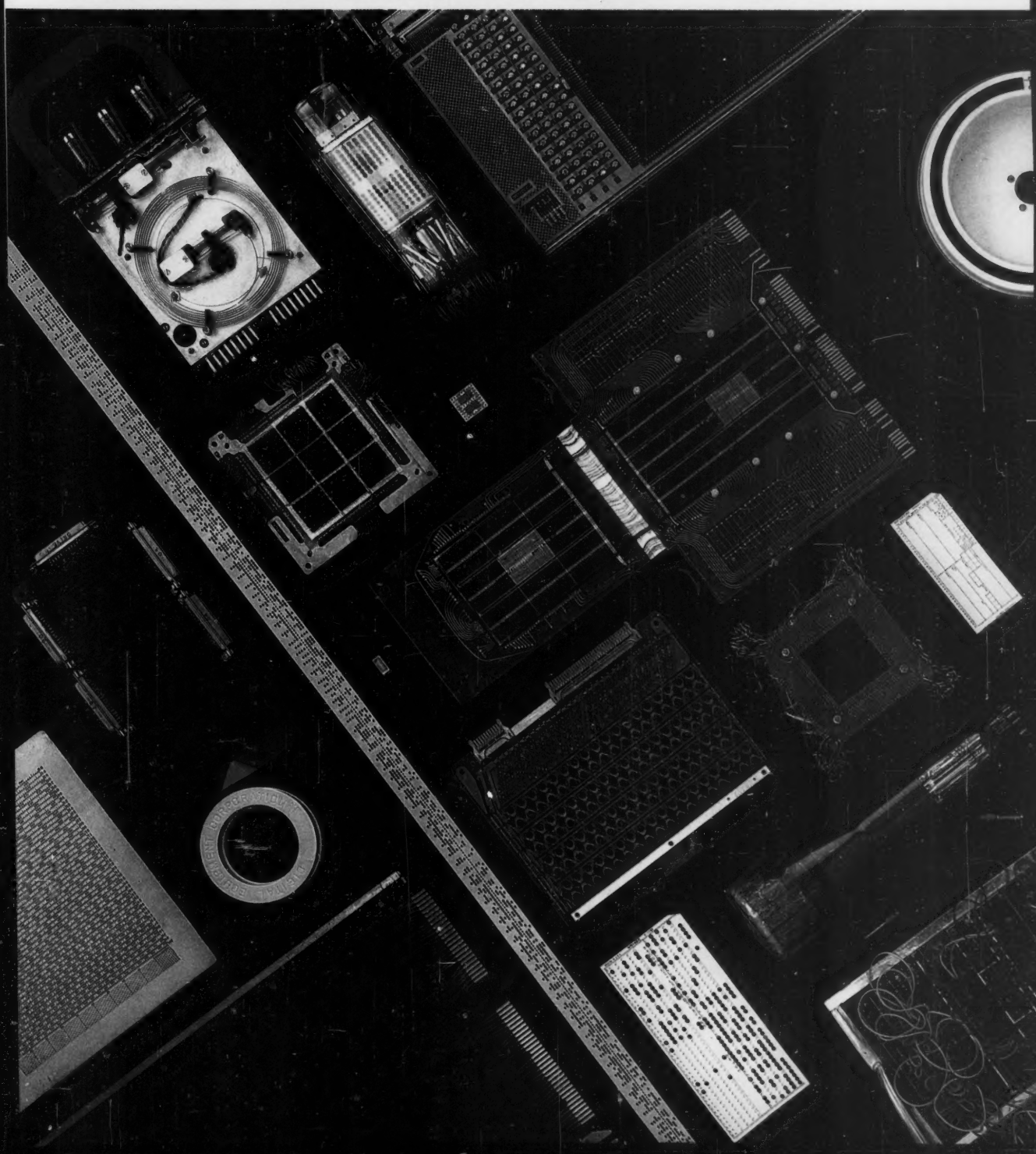
The Computer Museum

Located on Museum Wharf
300 Congress Street, Boston, MA 02210
(617) 426-2800

1

COMPUTER MEMORIES FOR SALE

Special thanks to this publication, Scitex America Corp. (color separations), Grafik Communications, Ltd. (design), David Sharpe Studio (photography) and VM Software, Inc. (poster).



GM payment system opened

From page 83

security, encrypting data and authenticating messages to determine if they have been altered.

GM expects to reduce costs with electronic payments by eliminating paperwork. Woo would not say how much cost reduction is expected.

But the company is also implementing electronic data interchange (EDI) to reap the benefits offered through integration of previously isolated data. As much of 70% of data in one auto maker's computer is used by another, and re-entering data manually creates aggravation and the possibility of error, according to Michael Gerus of the Auto Industry Action Group, which is aimed at improving competitiveness.

GM and other industry officials emphasize that electronic payments are just one aspect of the more far-reaching implementation of EDI, the electronic exchange among companies of business documents such as shipment notices and material releases. For example, EDI is expected to help the auto makers implement just-in-time inventory, a major step toward improving productivity.

"We recognize the movement of related information has become as important as movement of funds themselves. The story here is one of electronic data interchange, not just electronic payments," Gerus said.

GM's project is also expected to educate banks regarding routine electronic payments. "The people at GM have been very cautious about planning for acceptance by the banking community. A lot of banks are looking at this as an opportunity to bring in new customers," Gerus added.

Workers share in start-up

From page 83

barriers between engineering and manufacturing are like England. You have the House of Lords and the House of Commons who get together every once in a while to praise the queen, but don't talk about much that's meaningful."

This barrier is central to the problem of CIM management. The purpose of CIM is integration, not only of computer systems, but of the various departments of the organization.

Deere & Co.'s Rankin said manufacturing engineers who design production methods have become part of the product design group to help narrow the traditional gap between the two departments. "We have a manager of engineering overseeing both sides for a particular project," Rankin remarked.

Teamwork

The concept of teamwork like the work groups at Deere & Co. consistently crops up in interviews with manufacturing managers. At the Cone Drive division of Excello Corp., for instance, MIS director Paul Brauninger recalled an incident involving a personal computer with a color monitor.

When this PC was installed on the factory floor, the workers, who had been using monochrome monitors, were so taken with the color monitor that they all wanted one, Brauninger said.

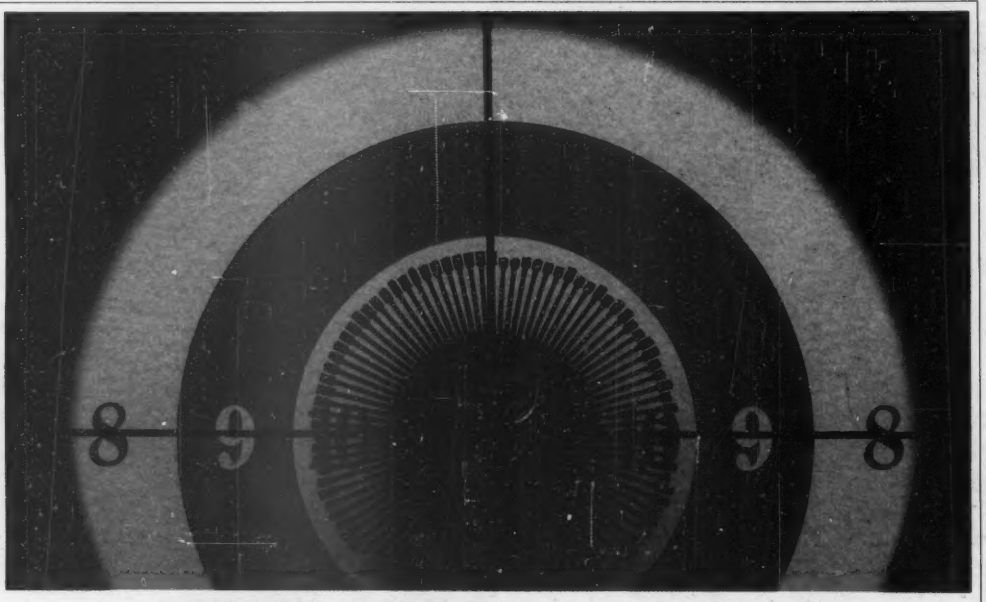
Since the monochrome systems were sufficient, the idea of purchasing new color monitors was ruled out. So Brauninger had the one color system taken off the factory floor.

According to this MIS director, it was better to have none than have one worker using a PC that other workers perceived as special, or better, than their equipment.

At the IBM display production facility, located in Research Triangle Park, N.C., Plant Manager of Communications Systems Gene Addesso said education is key to a sucessful CIM implementation.

When the facility began its automation program in 1984, meetings were held with employees to discuss competitive pressures from offshore producers, he said. The idea, Addesso said, was that employees will accept change more quickly if they fully understand why it must take place.

To boost morale, the facility declared a company holiday and sponsored a party that cost $200,000, Addesso said. "We wanted to show the importance we place on employees," he added.



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NEW PRODUCTS

Package offers dynamic linking for IBM users

Dynasoft Corp. in Rosemont, Ill., has announced the Dynasoft Integrated Software System for IBM mainframe computers using MVS/TSO and VM/CMS.

The integrated software package is said to dynamically link the spreadsheet, word processing, graphic and data base interface business functions.

According to Dynasoft, the software features include full overlay windows. This feature allows the user of the software package to simultaneously view and manipulate data in the spreadsheet, graphic display and word processing document.

Document changes

Overlay windowing lets the user see changes in the graph or word processing documents as information in the underlying spreadsheet is altered, the vendor explained.

A company spokesman said the integrated software package allows graphs to be used as a tool for understanding the dynamics of different types of information that are being processed during the analysis phase.

Other features include pop-up menus that prompt the user for commands and the fact that users need learn only one set of command syntax to operate all four systems.

All processing is done in one environment, the vendor said.

The Dynasoft Integrated Software System is priced between $17,500 and $49,000, depending on the size of the machine.

For Dynasoft users who already use Dynaplan, an upgrade pricing plan is available.

HP unveils processing aid

Emulator/analyzer aimed at micro development

Hewlett-Packard Co. in Palo Alto, Calif., has introduced an emulator/analyzer combination for the Motorola, Inc. 32-bit MC68020 microprocessor for the HP 64000-UX microprocessor development environment.

This emulator/analyzer combination is said to provide real-time emulation at 20 MHz with no-wait states while code is executed out of the emulation or target memory.

According to the vendor, the HP 64000-UX microprocessor development solution is said to provide an environment for the design, testing and integration of hardware and software and includes an HP 64416A/B emulation subsystem with either 256K bytes or 512K bytes of emulation memory.

An HP 64411A analysis bus generator board and the HP 64404A/64405A integrated-analysis board are also provided.

Emulation and analysis features include real-time execution up to 20 MHz with no-wait states out of user or emulation memory; up to 512K bytes of emulation memory; dual-ported emulation memory; emulation memory mappable in 256-byte blocks; and emulation memory mappable over full 4G-byte address space of the MC68020.

Other attributes include full-function code support in memory access; real-time analysis of bus-cycle activity; disassembly of MC68020 and MC68881 instruction set; display of MC68881 floating-point coprocessor registers; trace buffer 2,048 states deep; and 32-bit ranging on address and data.

A complete HP emulation and analysis subsystem that fits into the HP 64000-UX microprocessor-development environment with 512K bytes of emulation memory costs $27,985.

Synercom software, DEC computers combine to form DVS workstation

As part of its recently announced distributed architecture, Synercom Technology, Inc. in Sugar Land, Texas, has introduced its Distributed VS Station (DVS) for mapping information management.

The DVS combines Synercom's workstation support software with Digital Equipment Corp.'s Vaxstation computer family to create a workstation with an on-board VMS-based Microvax II computer.

According to a company spokesman, the DVS features resident processing power that works with Synercom software to perform computer-intensive processes at the workstation, instead of relying on the resources of a host system.

The distribution of the processing load allows a virtually unlimited number of workstations to be connected as part of a distributed data base network.

User-interface software features include icons, pop-up menus and multiple graphic windows. The DVS is said to provide multiwindowing and multitasking, allowing multiple processes to run at the workstation concurrently.

The DVS runs in a Decnet environment. It is available as a turnkey system including software and hardware with prices starting at $38,300.

INSIDE

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CDC enhances EDI services for business communications

Control Data Corp., based in Minneapolis, has expanded its electronic data interchange (EDI) services to offer new microcomputer capabilities and enhanced communications products.

The new services, Redi-Micro, Redi-Comm and Redi-3780, are part of the Redinet electronic data interchange system offered by Control Data's Business Information Services group. The products are used to electronically prepare, transmit and receive business communications, such as purchase orders and invoices.

Redi-Micro is a menu-driven program that generates and interprets material releases, purchase orders, invoices and replies. It includes communications software to transmit information via the Redinet telecommunications network.

Redi-Comm transmits and receives information asynchronously. Redi-3780 offers users bisynchronous communications. The vendor said both communications products are activated by a single command, and monitor and correct transmitted information. Both can also produce audit reports on the transmissions.

Redinet products are offered separately or can be grouped with other Redinet services. Redi-Micro, Redi-Comm and Redi-3780 operate on IBM Personal Computers, PC ATs, XTs and compatibles. Redi-3780 requires an additional AST, Inc. interface board for bisynchronous communications.

Redi-Micro costs $700 and includes a copy of either Redi-Comm or Redi-3780 software. In addition, Redi-Comm and Redi-3780 can be purchased separately for $200 and can be used with any industry standard transaction processing system.

Redinet was introduced in 1984 as a nationwide data network for the industrial marketplace. All products use the ANSI X.12 protocol for defining common information transactions. Redinet supports other standard EDI formats commonly in use.

Honeywell adds three support modules to office network system

Honeywell, Inc. in Billerica, Mass., has added three modules to its Office Network Exchange Plus (One Plus) integrated departmental system.

The modules include Onegraph Business Graphics; Onedocument Workstation Facility, for the creation of compound documents containing both graphics and text; and Onespell Plus, which are business and medical spelling verifiers and correctors.

One Plus supports communications among a variety of Honeywell and non-Honeywell systems, including multimedia document creation and intersystem data base access. One Plus modules run on Honeywell's DPS 6 Plus virtual systems and the DPS 6 family of small computers.

The Onegraph Business Graphics package provides users with business graphics capabilities. End users may enter new data or use data originating in other applications. Programmers can build graphic capabilities into applications. Features include American National Standards Institute's Computer Graphics Interface and Onecalc spreadsheet inputs.

Onegraph consists of five separately priced components. Onegraph Executive, providing the underlying support for the other components, is priced from $220 to $395. Onegraph Interactive Facility, said to allow access to Onegraph capabilities through either menus or commands, is priced from $330 to $595. Onegraph Application Development Facility, said to allow C, Fortran and Cobol programmers to use Onegraph within their applications, costs from $825 to $1,495.

The Onegraph Workstation Facility allows a personal computer to be used as a workstation. It costs $595. The Onegraph Device Controller Facility allows support of additional graphic output devices. It costs $495.

The PC-resident Onedocument Workstation Facility costs $595. Onespell Plus, available in a business lexicon version or a medical and business lexicon version, costs from $550 and $735, respectively.

SOFTWARE & SERVICES

Systems software

Telesoft has announced **Telegen2 1750A**, a software development and execution environment for the Ada programming language.

Hosted on the Digital Equipment Corp. VAX under VMS, the system contains Telesoft's second-generation compiler, object tools including an Ada linker, library manager, library tool set, Ada execution environment and cross-compilation system for embedded MIL-STD-1750A targets. Productivity tools include global optimizer and language tools.

License fees for the Telegen2 1750A product line range from $17,000 to $86,000.

Telesoft, 10639 Roselle St., San Diego, Calif. 92121.

■

Internet Systems Corp. has announced its quality assurance program, **Automated Testing System** (ATS), for its Internet System banking software program.

ATS is said to provide integrated automated quality control. It inputs the bank's test cases, compares the actual with expected results and reuses the test cases to validate a system installation or change. ATS also generates exception reports, which notify users of transactional errors.

ATS, which is a separate add-on subsystem for the Internet System, is priced at $100,000. The basic Internet System is priced at about $1 million, depending on configuration.

Internet, Suite 700, 200 W. Madison St., Chicago, Ill. 60606.

■

Computer Associates International, Inc. has announced **CA-JARS/CMS 6.0**, an enhanced version of its performance management and job accounting system for the IBM VM environment.

New features include minidisk accounting, on-line budget inquiry and user interfaces and automated report generation and file backup.

A report writer, which is said to allow the VM user to generate any report using free-form commands, is also included.

CA-JARS/CMS 6.0 costs $15,000.

Computer Associates International, 711 Stewart Ave., Garden City, N.J. 11530.

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REALIA, Inc.
Chicago, IL

REALIA, Inc. manufactures REALIA COBOL, a micro COBOL compiler with the capacity, compatibility and speed to move development work — or production systems — from the IBM mainframe to a PC. When Marc Sokol, REALIA's Vice President, wanted MIS/DP directors to know about his compiler product, he chose Computerworld.

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A PUBLICATION OF CW COMMUNICATIONS

Applications packages

P-K Marketing Associates, Inc. has announced **Customer Information System (CIS)/38**, a customer or marketing data base written in RPG III for the IBM System/38.

CIS/38 is designed to support in-house development of customer, marketing and distribution and sales-related applications. Data base features include support for businesses that have customers with multiple customer numbers, shipping points, sales representatives and divisions. Data elements included are related to accounts reeeivable, credit and collection, sales and marketing, pricing, invoicing, orders, shipping and freight.

CIS/38 costs $4,500.

P-K Marketing Associates, P.O. Box 144, Suffield, Conn. 06078.

■

Path Systems has announced the **Path Benefits Administrator**, a software program for company benefit administration.

The program is said to calculate insurance premiums for the company and its employees while performing related enrollment administration. The program can be customized to handle any number of plans. Features include on-line Help, mass update, planning or open enrollment periods, standard enrollment reports, contribution summaries, benefit statements, payroll notification and Consolidated Omnibus Budget Reconciliation Act reporting.

The Benefits Administration interfaces with Path system or other programs. It costs $1,900. A stand-alone version costs $2,500.

Path Systems, Suite 103, 4575 Scotts Valley Drive, Scotts Valley, Calif. 95066.

■

McDonnell Douglas Information Systems Group has announced an **Assembly Modeler** three-dimensional design package for its Graphics Design System computer-aided design and engineering product.

The Assembly Modeler is said to allow users to manipulate 3D building components within a two-dimensional environment. Features include automatic interference checking, drawing coordination, perspective images and integration of 2D and 3D data.

Prices start at $3,000.

McDonnell Douglas, 325 McDonnell Blvd., St. Louis, Mo. 63042.

Languages

Computer Cognition has announced **Acucobol**, a C-based, Ryan-MacFarland Corp. Cobol-compatible compiler for Unix and Digital Equipment Corp. VAX/VMS and VAX/Ultrix environments.

The compiler is said to feature 3,500 line/min. compiles, support for 16 open files in Unix and Ultrix environments and a built-in windowing option.

Prices for Acucobol start at $600 for a single-user personal computer system; $1,000 for micro systems; and $3,000 for minicomputer systems.

Runtime interpreters cost $175 each for PCs, $300 for micros and $450 for minis, the vendor said.

Computer Cognition, 6696 Mesa Ridge Road, San Diego, Calif. 92121.

Interactive Software Engineering, Inc. has announced **Eiffel**, a compiler and programming environment.

Eiffel is a language and a set of tools. The language is said to offer classes with multiple inheritance, generic parameters in the Ada style and information hiding. It includes the ability to express assertions and invariants and is statically typed.

Eiffel is available on the Unix operating system. It is priced from $2,995.

Interactive Software Engineering, Suite 7, 270 Storke Road, Goleta, Calif. 93117.

Utilities

SDM International, Inc. has announced a combined IBM Systems Network Architecture/Binary Synchronous Control batch communications software product called **SDM/Link**.

SDM/Link is said to provide CPU-to-CPU data transfer capabilities for IBM 3000, 4300 and 9300 series computer systems. It can be used as a remote job entry workstation for IBM's RSCS, JES2, KES3 and Power/RJE subsystems.

SDM/Link is priced from $5,000 to $12,000.

SDM International, 134 Spring Ave., Fuquay-Varina, N.C. 27526.

■

Amalgamated Software of North America, Inc. has announced **Call/Parm** for the IBM System/36.

The Call/Parm facility is an addition to the vendor's RPGIII compiler. It is said to give RPG programs the ability to call other RPG programs dynamically, allowing parameter passing between programs and return of control back to the calling program.

According to the vendor, it has no program size restrictions. Calls can be nested to any depth, and RPG source can refer to common files by the same name.

The RPGIII compiler with the Call/Parm facility is priced at $1,000.

Amalgamated Software, P.O. Box 6610, Malibu, Calif. 90264.

■

Syco System Communications, Inc. has added **Automatic Backup** to its After Hours Software product line.

Automatic Backup is a VMS/MicroVMS menu-driven backup service for Digital Equipment Corp.'s VAX computer family. It is said to allow full, incremental and partial disk copies, which, once defined, can automatically be repeated either daily, weekly, biweekly, quad-weekly or quarterly.

Other features include the ability to run in the background, security and the ability to back up onto tapes, disks or laser disks.

Prices range from $700 for an RX50 MicroVMS license to $1,250 for a TK50 VMS license.

Syco System Communications, Box 838, 165 Mechanic St., Leominster, Mass. 01453.

■

GT Software, Inc. has announced **Release 1.6** of its Help screen/menu processor for CICS called **Assist/GT** in addition to **Preval/GT**.

Preval/GT is said to validate screen input data external to a user's calling programs as part of the BMS screen display. No programming is required to perform range checks, table lookups, field cross-checking or to handle decimal alignment, negative numbers and percentages.

Assist/GT Release 1.6 includes the ability to move screen data from one location to another, suspend a transaction while invoking another transaction and display an initial window that can then select another window, a full-screen Help display or an online manual. Also included are 52 program function keys.

Assist/GT costs $5,500 for VSE and $6,900 for MVS. Preval/GT costs $11,000 for VSE and $13,800 for MVS.

GT Software, 4411 E. Jones Bridge Road, Norcross, Ga. 30092.

J & L Software, Inc. has announced **Mimesis** software, a customizable interface said to emulate the input of various operating systems.

Mimesis software comes with a sample Digital Equipment Corp. VMS- or Microsoft Corp. MS-DOS-style shell and the Mimesis compiler, the tool used to create and modify users' interfaces. Mimesis can also be used to limit the command set for a designated number of users, according to the vendor.

Users can create any number of interfaces for one environment or for an entire company. Mimesis is supported on the Unix operating system and can run on most systems supporting the C language.

Prices range from $2,000 to $10,000 per CPU.

J & L Software, 1337 Heidi Drive, Plano, Texas 75023.

Data base management systems

Infodata Systems, Inc. has announced the release of **Version 86.1** of **Inquire/Text**, its text data base management system.

Inquire/Text is said to combine a data base foundation with the ability to process structured and unstructured data in a single system. Version 86.1 includes faster response time, reduced CPU time, fewer I/Os and reduced memory utilization, particularly in large data base multiuser environments.

Other features include enhanced diagnostic facilities and improvements to buffer sharing and routing.

Inquire/Text is priced from $49,500.

Infodata, Five Tobey Village Office Park, Pittsford, N.Y. 14534.

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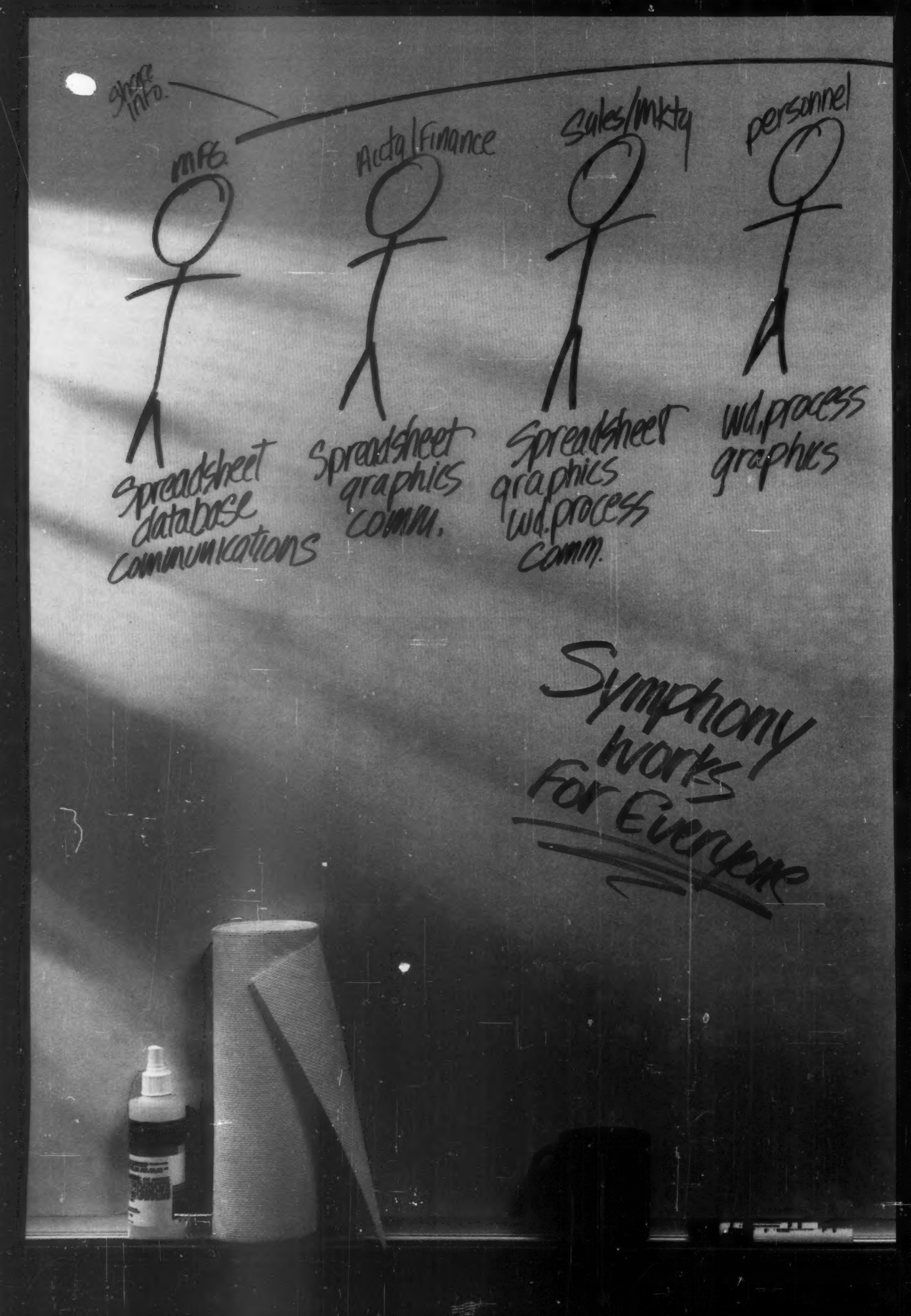
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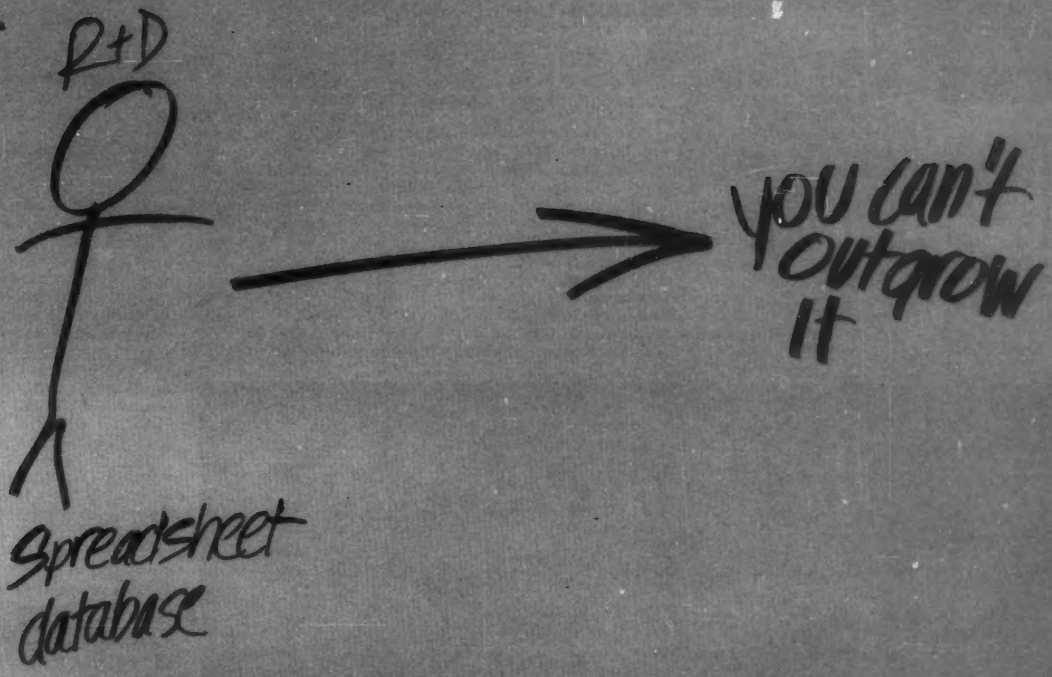

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MICROS

Systems

Edicon, a Kodak company, has announced the **Edicon System**, a photoimage management system said to integrate photographic images with text and graphics in a computerized data base.

The system captures color images and allows them to be displayed and arranged on a high-resolution monitor.

Once captured, images are electronically stored along with associated text and graphics for later display or transmission to other video monitors on the system, the vendor said.

The system combines a video camera, IBM Personal Computer, color video monitor and proprietary hardware and software.

Systems are priced from $35,000.

Edicon, 907 Culver Road, Rochester, N.Y. 14609.

Software applications packages

The **Dynaware Division** of **Sun Grade, Inc.** has announced **Dynaperspective**, a three-dimensional, solids modeling graphics software package designed for IBM Personal Computer XTs, ATs and compatibles.

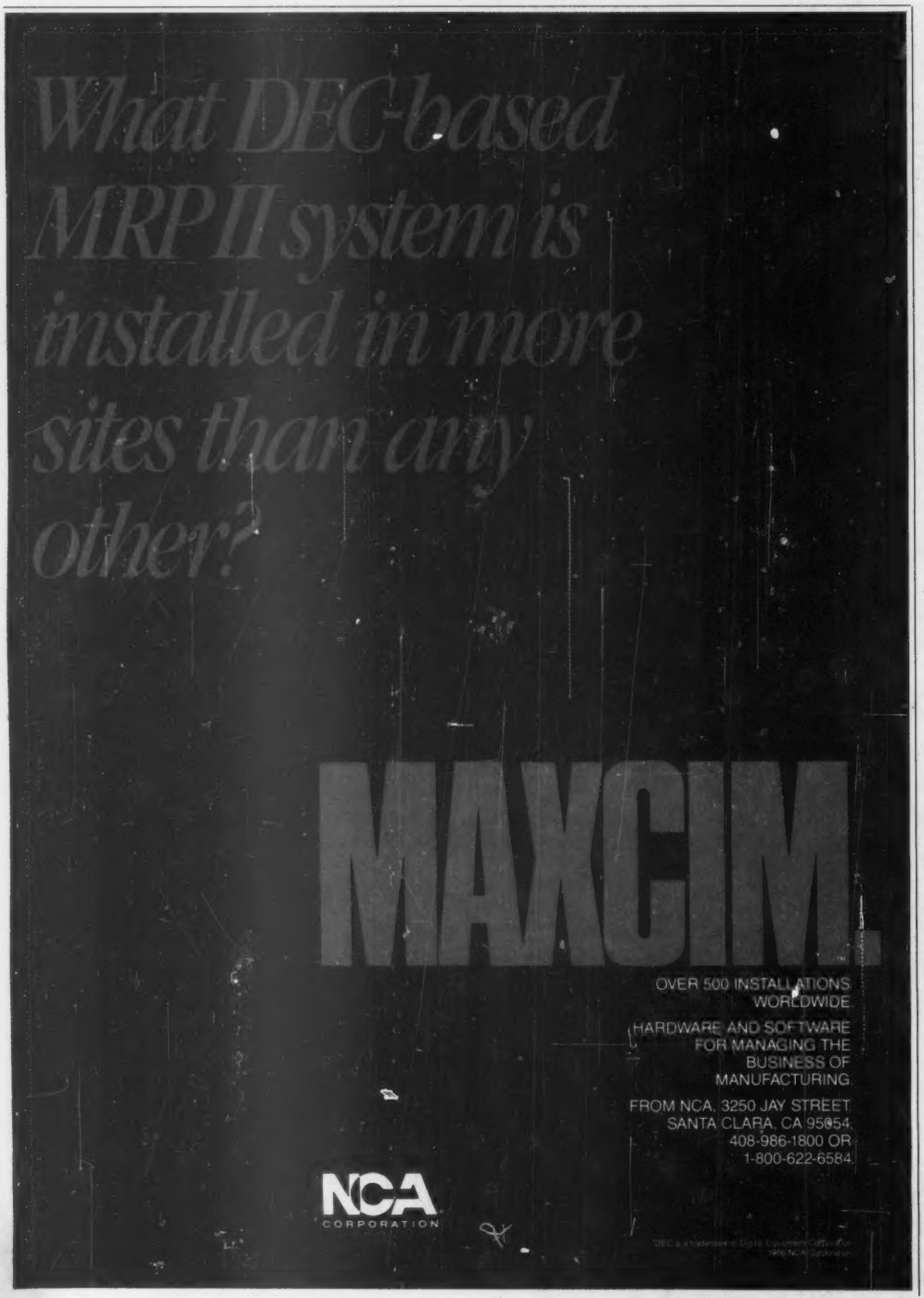
According to the vendor, Dynaperspective combines line, shape and form as well as color and shade to create renderings in two- and three-dimensional formats.

Features of the product include solid surface modeling and the ability to present three-dimensional renderings with full-surface color and light-source shading.

Other features include a library of frequently used symbols and pull-down menus.

Dynaperspective is priced at $1,850.

Dynaware, Suite 316, Bellefield Bldg., 1309 114th S.E., Bellevue, Wash. 98004.



Computer Product Introduction Corp. has announced **Cash Drawer**, a software product for IBM Personal Computers and compatibles.

Cash Drawer is a point-of-sale accounting package said to handle the needs of a retail business, including sales, rentals and services such as time/billing or repairs.

Reports are programmed in and there is a custom-report generator. The software offers four levels of password security and provides an interface with light-bar menus and context-sensitive Help, according to the vendor.

Cash Drawer costs $1,295.

Computer Product Introductions, 2127 Bellevue Way S.E., Bellevue, Wash. 98004.

■

International Micro Systems has announced the **Focus on Business series** of 16 software systems said to run on local-area networks.

The series includes a range of accounting software plus specialized packages for doctors, dentists, manufacturers, wholesalers and churches and other nonprofit organizations.

Features are said to include a network log that allows the software to keep track of its own usage and record locking that allows more than one person to use a data file concurrently.

Each application is said to run in either single-user mode or a multiuser environment.

Each Focus on Business accounting system is priced at $650, the vendor said. Vertical systems are priced at up to $1,995.

International Micro Systems, 6445 Metcalf, Shawnee Mission, Kan. 66202.

Software utilities

Digital Learning Systems, Inc. has announced **Keynotes**, a memory-resident support program said to provide access to reference materials.

Keynotes combines the features of a documentation package, information-retrieval program and built-in Help system for IBM Personal Computers. The program includes a key word/key phrase search feature, a built-in text editor, a Basic programmer's guide, a tutorial on spreadsheet macros, a list of international dial codes and time zones and a chart of common abbreviations.

Users can store more than 100 pages of tailored information such as document formats, access codes, macros and user instrutions.

Keynotes is priced at $100.

Digital Learning Systems, 4 Century Drive, Parsippany, N.J. 07054.

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Communications

Arnet Corp. has announced **Smartport**, a communications board for multiuser IBM Personal Computer AT- or Intel Corp. 80386-based systems.

Smartport includes an on-board processor to drive terminals, printers and other devices connected to its four or eight serial RS-232 ports. It works with Unix, Xenix and other multiuser operating systems.

According to the vendor, the board contains 64K bytes of dual-ported random-access memory.

Smartport costs $895 with four serial ports and $1,295 with eight serial ports.

IBM PC-DOS and Xenix drivers cost $25 and $50, respectively.

Arnet, 476 Woodyrest Ave., Nashville, Tenn. 37210.

Anderson Jacobson, Inc. has introduced the **AJ 1212-STH** 1,200 bit/sec. and the **AJ 2412-STH** 2,400 bit/sec. Hayes Microcomputer Products, Inc. AT-compatible modems.

The modems feature autodialer, nonvolatile memory, voice-data switching, an on-line inactivity timer and a choice of MI/MIC or A/A1 operation. They were designed for synchronous or asynchronous communication over standard dial-up telephone lines.

The AJ 2412-STH meets CCITT V.22 bis, V.21 and V.22 protocols and Bell Laboratories' 103 and 212A standards; the AJ 1212-STH meets all but CCITT V.22 bis.

The AJ 1212-STH and AJ 2412-STH cost $295 and $395, respectively.

Anderson Jacobson, 521 Charcot Ave., San Jose, Calif. 95131.

Hayes Microcomputer Products, Inc. has enhanced its **Smartcomm II** software for the IBM Personal Computer Network.

The communications software is now said to support the IBM Token-Ring Network.

This version is said to give users on the PC Network and the Token-Ring Network the ability to share modems and asynchronous communications ports.

It extends the Smartcomm II functions to all personal computers on either type of network, the vendor said.

Smartcom II for the IBM PC network and Token-Ring Network contains five User's Guides, one System Guide and one program disk. It costs $599.

Hayes Microcomputer Products, P.O. Box 105203, Atlanta, Ga. 30348.

Printers/Plotters/ Peripherals

Citizen America Corp. has announced **Overture 110**, a laser printer, and **Tribute 224**, a dot matrix line printer.

Overture 110 features 10 pag/min. printing, 512K-byte memory for graphics and front-download capability. It comes with both parallel and serial interfaces as well as multiemulations of Epson America, Inc.'s PF-286 , Diablo Systems, Inc.'s 635 and IBM's Proprinter.

Tribute 224 is a 200 char./sec. 24-wire printer. it produces graphics with 360 dot/in. resolution and a 24K-byte input buffer memory. It has parallel and serial interfaces, automatic paper loading and bidirectional printing.

Overture 110 costs $2,395, and Tribute 224 costs $949.

Citizen America, Suite 300, 2425 Colorado Ave., Santa Monica, Calif. 90404.

■

Magnovox has introduced the **8CM873** multimode color display monitor.

According to the vendor, the display can automatically switch scan frequencies to display a variety of graphics formats. It works with signals requiring horizontal scan rates in a range of 15 KHz to 34 KHz. It can configure itself to operate at the correct scan rate and can accept either digital or analog signals. The product features an image resolution of up to 926 dots by 580 lines and audio input capability.

The multimode color display is priced at $900.

Magnovox, P.O. Box 14810, Interstate 40 and Straw Plains Pike, Knoxville, Tenn. 37914.

■

C. Itoh has announced the **Prowriter C-815 Supra**, a 24-pin printer.

The printer is said to reach speeds of 162 char./sec. in letter-quality mode. It emulates the IBM Proprinter XL, the Toshiba Corp. P351 and the Qume Corp. Sprint 11. It features a 42K-byte buffer, bidirectional graphics and built-in character fonts, including Courier 10, Prestige 12 and Supersubscript. A pull-type tractor feed is standard. All functions are said to be front panel-selectable.

The C-815 costs $1,995.

C. Itoh, Suite 220, 19750 S. Vermont Ave., Torrence, Calif. 90502.

■

Digital Communications Associates, Inc. has announced **Version 1.5** of its **Smart Alec** terminal emulation board.

Smart Alec is an IBM Personal Computer to IBM System/34, 36 and 38 communciations link. It provides PC users the features of a 5251 Model 11, 5291 or 5292 Model 1 while keeping the PC processing capabilities.

The upgraded software allows the user to remap a keyboard to be identical to the vendor's Irma E78 emulator when running IBM's 3270 passthrough software. It is also compatible with software for the IBM Enhanced 5256 system printers.

Smart Alec costs $895.

Digital Communications Associates, 1000 Alderman Drive, Alpharetta, Ga. 30201.

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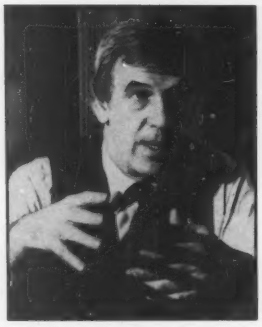

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Auxiliary equipment

Xerox Corp. has announced **PC Type Right**, an electronic dictionary for use with IBM Personal Computers and compatible systems.

PC Type Right is said to check spelling as text is typed. It includes a 100,000-word dictionary as well as a 1,200-word personal dictionary. Errors are signaled by a beep tone. The unit is installed between the computer keyboard and the computer.

PC Type Right costs $199.95.

Xerox, Xerox Square 006, Rochester, N.Y. 14644.

■

Kurta Corp. has announced the **Kurta GIS** cordless graphic input system for the Apple Computer, Inc. Apple IIGS computer.

The Kurta GIS includes either a cordless pen or cordless puck and a tablet and can be used as either a mouse or a graphics table, the vendor said. Users can switch between mouse and tablet mode while working on applications. Up to four Kurta GISs can be connected to a single Apple IIGS.

The Kurta GIS costs $495.

Kurta, 4610 S. 35th St., Phoenix, Ariz. 85040.

COMMUNICATIONS

Multiplexers/Modems

Ungermann-Bass, Inc. has introduced the **Network Interface Unit 140** (NIU-140).

The NIU-140, when teamed with a pair of the company's high-speed remote bridges and a T1 line, provides an alternative to multiple lower speed leased lines, multiplexers and modems, according to a company spokesman. The NIU-140 also supports point-to-point connections between two synchronous devices located on the same Net/One network.

The device is said to support common industry synchronous protocols from IBM, Digital Equipment Corp., Unisys Corp., which is the partnership of the former Sperry Corp. and Burroughs Corp., and Honeywell, Inc.

The NIU-140 costs $2,595 for baseband models and $2,995 for broadband models.

Ungermann-Bass, 3900 Freedom Circle, Santa Clara, Calif. 95052.

■

Touchbase Systems, Inc. has announced the **Worldlink 1200 Portable** modem.

The battery-powered Hayes Microcomputer Products, Inc.-compatible device is said to provide a direct interface for acoustic cup operation at both 300 and 1,200 bit/sec.

Features include autodial, autoanswer and pulse and tone dialing. It provides for dual communications standards supporting Bell Laboratories 103/212A standards as well as the internationally recognized CCITT V.21 and V.22. The standards are switch- and software-selectable.

The Worldlink 1200 costs $199.

Touchbase Systems, 16 Green Acre Lane, Northport, N.Y. 11768.

Analytics Communications Systems has announced a dual-port multiprotocol communications card, the **MP-Comm**, for the IBM Personal Computer family and compatibles.

MP-Comm is said to provide asynchronous communications with Software Synergy, Inc.'s Respond All Asynchronous and 3270/3770 operations with Respond Synchronous 3270 and operates with Autodin Mode I. The card has two DB-15 port terminations and supports full-duplex operation to 19.2K bit/sec.

MP-Comm costs $1,995 with Autodin Mode I. The addition of Respond All Asynchronous costs $2,195. The addition of Respond Synchronous 3270 costs $2,495. With both asynchronous and synchronous, MP-Comm costs $2,595.

Analytics Communications Systems, 1820 Michael Faraday Drive, Reston, Va. 22090.

LeCroy Corp. has announced the **Series 5900 Fiber Optic Modem**, designed for operation with IEEE 802.4 media access-control machines.

The Model 5900 Fiber Optic Amplifier/modem and its companion product, the Model 5901 Fiber Optic Transceiver, are said to allow the user to implement network topologies such as passive star, active star and actively tapped bus as well as hybrid

Continued on page 98

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NEW PRODUCTS/COMMUNICATIONS

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topologies combining elements of all the previous types.

The Series 5900 products are plug-compatible with Manufacturing Automation Protocol network controllers. The basic signaling rate of the model 5900 is 10M bit/sec. It is available in the VME form factor.

Model 5900 AV costs $1,800; Model 5900 BV costs $1,200; and Model 5901 costs $800.

LeCroy, 700 S. Main St., Spring Valley, N.Y. 10977.

■

Electro Standards Laboratory, Inc. has introduced the **Model 4000-RM** asynchronous multipoint rack-mounted line driver.

The unit is said to provide full-duplex transmission over customer-owned four-wire circuits. Up to 16 units can operate over one line. The Model 4000-RM is transparent to code, parity and transmission speed. The product will operate at data rates up to 19.2K bit/sec. over one mile of 24-gauge twisted-pair cable.

The two-channel device is priced at $270.

Electro Standards Laboratory, P.O. Box 9144, Providence, R.I. 02940.

■

Anderson Jacobson, Inc. has announced the **9641-1D** leased-line modem for a universal card cage and compatible stand-alone enclosure.

The 9.6K bit/sec. modem provides unattended automatic dial backup. It offers full-duplex asynchronous or synchronous operation in point-to-point or multipoint applications with up to 15 drops on a single line.

The product is interchangeable between a central-site card cage and a remote-site stand-alone enclosure.

The AJ 9641-1D modem card and modem in the stand-alone enclosure cost $1,995 and $2,145, respectively.

Anderson Jacobson, 521 Charcot Ave., San Jose, Calif. 95131.'

■

Microcom, Inc. has introduced the **Intelligent Network Controller** (INC) for its High-Density Modem System (HDMS).

The HDMS is a rack-mounted, 32-modem system. The INC is said to provide systems managers with access to capabilities for management and control of the modem system as well as access to diagnostic information. An operator at a central terminal or operator console is said to be able to monitor status, review statistical data regarding line utilization and modem usage, run diagnostic tests on the modem modules and generate printed system status reports.

The Intelligent Network Controller is priced from $1,499.

Microcom, 1400 Providence Highway, Norwood, Mass. 02062.

Auxiliary equipment

Alfa Gat Ltd. has announced **Mul-T-Dial**, a personal computer dialer said to dial, redial, scan a telephone queue list and speak.

Mul-T-Dial consists of a short card and random-access memory software. It enables the user to instruct the system to dial to a group of numbers, one by one, while occupied with any other task in the computer.

The dialer checks both sides of the line for free or engaged signals and reports the status of each call. It notifies the user before a number is connected.

Mul-T-Dial costs $350.

Alfa Gat, P.O. Box 23142, Dizengoff Center, Tel Aviv 61231, Israel.

■

Dynapac, a Dynatech Co., has announced **Multi-Crypt X.25**, a logical channel encryption device for X.25 packet-switched networks.

The Multi-Crypt X.25 is said to use the data encryption standard algorithm. It enables multiple terminals and hosts to send encrypted data through public and private data networks. It provides two asynchronous CCITT X.25-compatible ports plus an asynchronous terminal port and can handle 64 or 128 simultaneous calls.

The Multi-Crypt X.25 costs $3,900.

Dynatech Packet Technology, 6464 General Green Way, Alexandria, Va. 22312.

■

Proteon, Inc. has announced the **P1380** interface board.

The board is said to plug into two IBM Personal Computer AT slots, allowing access to Proteon's Pronet-80 80M bit/sec. token-ring local-area network. It allows ATs to communicate on the same network with workstations and computers from vendors such as Digital Equipment Corp., Sun Microsystems, Inc. and Intel Corp., the vendor said.

The P1380 AT interface is priced at $4,900.

Proteon, Two Technology Drive, Westboro, Mass. 01581.

Voice/data communications

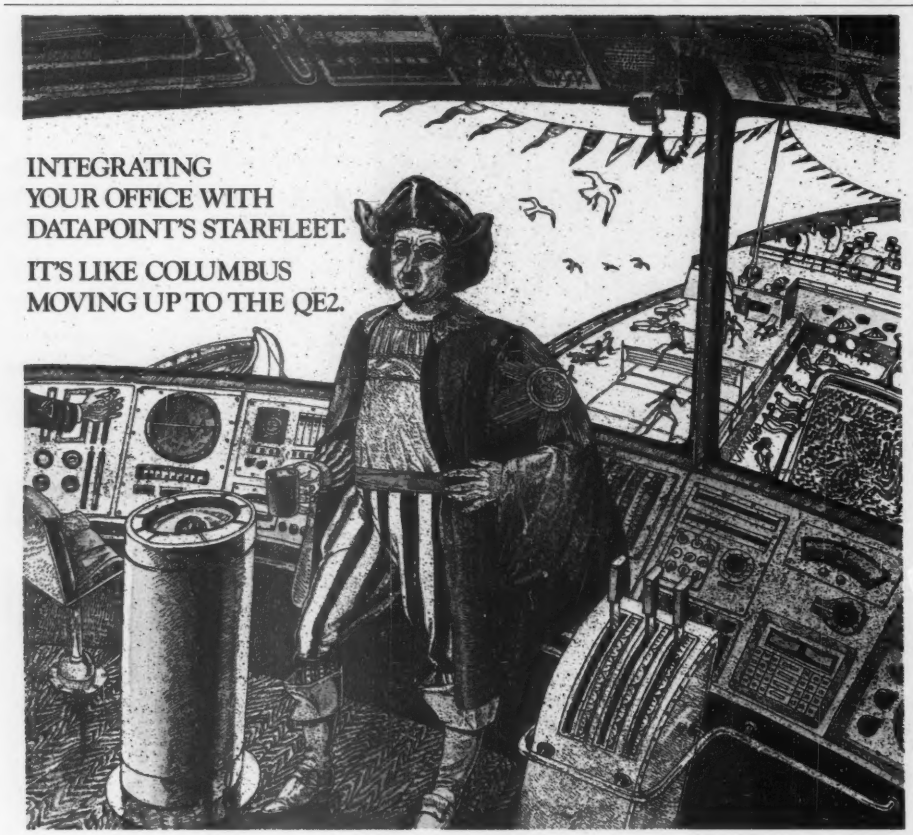
Dialogic Corp. has announced **Dialog/41**, a four-channel voice I/O system said to incorporate call analysis.

The Dialog/41 includes all the features of the vendor's Dialog/40 four-channel voice digitizing and telephone interface system. It allows an application to detect, after a call has been made, if the line is busy, if it has been answered or if an intercept has occurred.

The call-progress analysis occurs automatically after the dialing is complete.

The Dialog/41 system costs $1,395.

Dialogic, 60 Baldwin Road, Parsippany, N.J. 07054.



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SYSTEMS & PERIPHERALS

Processors

ICL North America has announced the **DS** series of Unix-based departmental computers for one to 128 users.

The DS Model 3 includes a Motorola, Inc. 68010-based processor that supports up to 16 users, including IBM Personal Computers and compatibles and graphics terminals.

The DS Model 4 supports up to 32 users; the DS Model 5 supports up to 48 users; the DS Model 6 supports up to 64 users and the DS Model 7 supports up to 128 users. All models in the DS series conform to X/Open standards for AT&T's Unix System V.

The entry-level DS3 costs $13,500. DS4 costs $22,800 and the DS5, 6 and 7 range from $95,000 to $250,000.

ICL North America, P.O. Box 10276, 777 Long Ridge Road, Stamford, Conn. 06904.

■

Umecorp has announced the **Knowledge Engine** (KE) and **Expert Controller** (EC) dedicated artificial-intelligence computer systems.

The host independent systems are said to be CMOS parallel-processing computers that deliver distributed real-time expert system control capability to factory automation. The systems use backward and forward chaining, negative logic and deferred judgment logic.

Both systems can provide users with up to 15,000-rule capacity. More than 200 KE systems may be combined using RS-485 multidrop to produce an integrated distributed network of expert systems of more than 3 million rules.

The KE and EC computer systems are priced from $4,000 to $10,000.

Umecorp, 275 Magnolia Ave., Larkspur, Calif. 94939.

■

Hewlett-Packard Co. has announced a **financial incentives program** that allows customers to upgrade HP 1000 real-time computers within the HP 1000/HP Precision Architecture family of technical computers.

The program allows users to return the HP 1000 E, F or A series for credit toward the purchase of a more powerful HP 1000 or HP 9000 Model 840. They will also receive credit for the memory in the returned system and for software upgrades accompanying the return of a computer.

The HP 1000 A-Series computers are priced from $5,000 to $35,000. The HP 9000 Model 840 is priced at $113,000.

Hewlett-Packard, 3000 Hanover St., Palo Alto, Calif. 94304.

■

Integrated Business Computers has announced the **Ensign 386:100**, a multiuser system said to run software available for Intel Corp. 80386 systems.

Ensign 386:100 is said to support up to 100 users. An entry-level system including one slave 68101 CPU with 1M-byte I/O buffer, 16 serial I/O ports, 1M-byte main memory, a 1.6M-byte floppy and a 25M-byte hard disk costs $8,695.

A fully expanded system includes four slave 68010 CPUs with more than 1M-byte I/O buffer, 100 serial I/O ports, 24M bytes of main memory, a 1.6M-byte floppy, a 60M-byte tape drive and three 280M-byte hard disk drives. It costs $72,895.

Integrated Business Computers, 21621 Nordhoff St., Chatsworth, Calif. 92311.

■

General Micro Systems, Inc. has announced the **GMSVO8** module said to meet VME and VMX 32-bit bus requirements.

The module provides up to 768K bytes of dual-ported nonvolatile memory in the form of either erasable programmable read-only memories (EPROM) or battery-backed CMOS static random-access memories (RAM). It can also provide up to 1.5M bytes of ROM/PROM or EPROM memory. Two different types of memory can be mixed on the board.

The GMSVO8 with 768K bytes of CMOS static dual ported RAM with battery back-up is priced at $2,895.

General Micro Systems, 4740 Brooks St., Montclair, Calif. 91763.

■

Digital Equipment Corp. has introduced the **Decmate III Plus**, a hard-disk version of the Decmate III floppy-based word processing system.

The system is said to offer the complete word processing features of the Decmate III. It can operate as a stand-alone workstation, a terminal or host system or be used for document transfer. It provides VT100 or VT200 series terminal emulation access either to a local-area network terminal server or a VAX host.

The Decmate III Plus system costs $4,695 including a 20M-byte hard disk drive, single floppy drive, monitor, keyboard, Master Menu software and DEC's word processing software.

Digital Equipment, Maynard, Mass. 01754.

■

Ranyan Corp. has introduced the **Model 68SU** Motorola, Inc. 68020-based supermicrocomputer designed to serve as a slave processor on Digital Equipment Corp. VAX computers.

The two-board slave units use a 68020 32/32 bit CPU and a 68881 floating-point coprocessor. The

Continued on page 100

Every year, American businesses lose an estimated $3 billion due to computer crime.* And as personal computers and distributed processing gain momentum, the problem of protecting mainframe computer resources will become even more critical.

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ACF2 is developed by SKK, Inc. Rosemont, Illinois. [redacted]

ACF2 is a registered trademark of SKK, Inc.

*Data published by Computer Security Institute, 1985.

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Continued from page 99

68020 is packaged with 8K bytes or 32K bytes of erasable programmable read-only memory and 32K bytes of static random-access memory (RAM) on a single hex-sized circuit board. A second quad-sized board contains the 68881 and up to 2M bytes of dynamic RAM.

The Ranyan Model 68SU slave processor is priced at $5,850 per two board set.

Ranyon, 15239 Springdale St., Huntington Beach, Calif. 92649.

Data storage

Dilog Corp. has introduced the **DQ696**, which is a controller designed to interface up to two disk drives to Digital Equipment Corp. Microvax, Micro PDP-11 and LSI-11 computers using the enhanced small disk interface (ESDI).

The DQ696 is contained on a single dual-height circuit board. It includes support of the ESDI parameter passing commands and flaw-maps used in drive formatting.

According to the vendor, the DQ696 controller also handles ESDI data transfer rates up to 21.9M bit/sec.

Other attributes include support for 16-, 18- and 22-bit Q-bus addressing in both block and nonblock modes.

The controller is capable of storing all drive characteristics on the drives themselves.

Up to 16 commands can be queued for one or two drives.

The DQ696 controller is priced at $1,450.

Dilog, P.O. Box 6270, 1555 S. Sinclair St., Anaheim, Calif. 92806.

Cipher Data Products, Inc. has introduced the **S310-Plus** disk controller and the **S320-Plus** disk/tape controller.

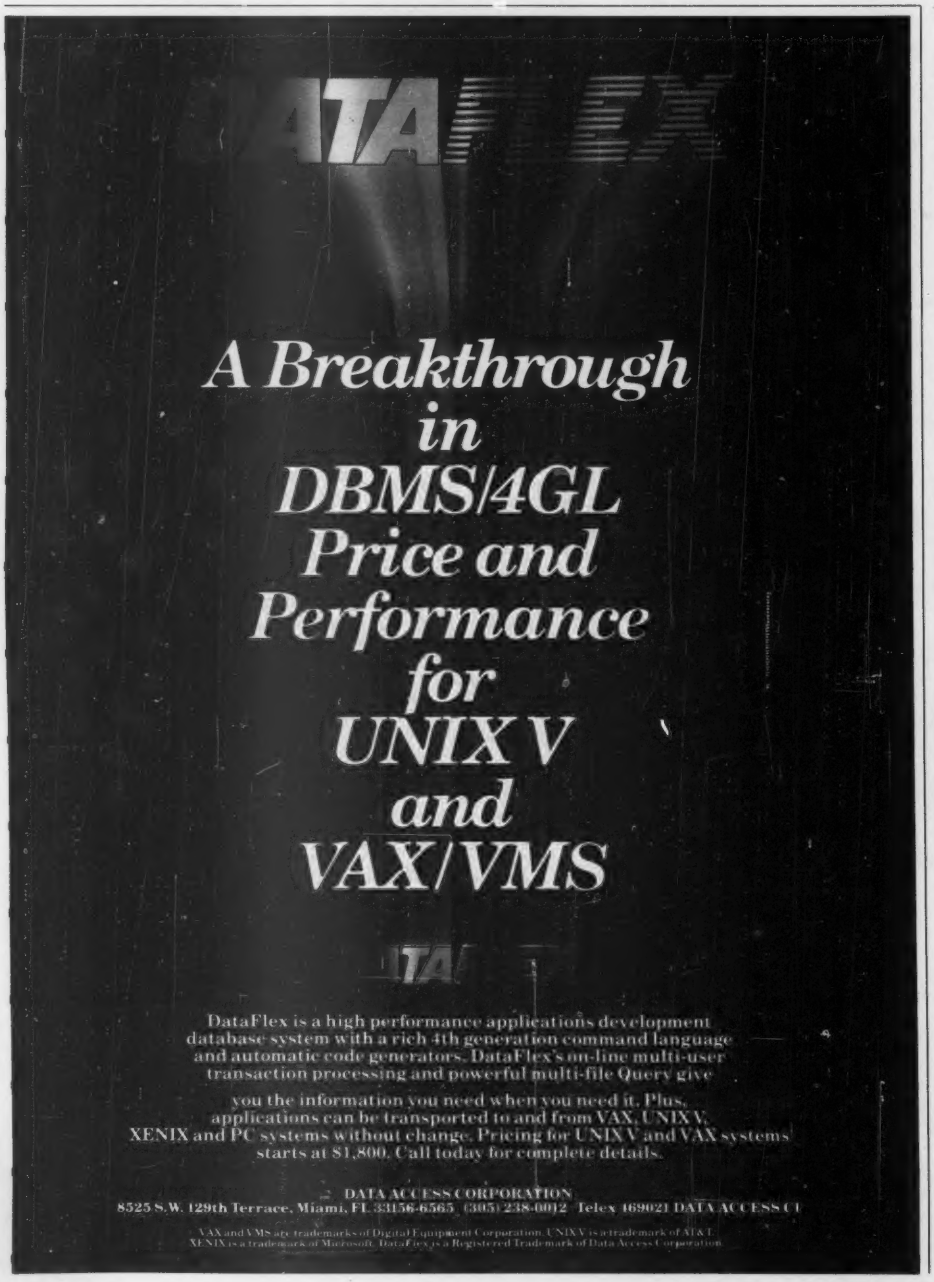
Both data channel high-speed controllers were designed for use on Data General Corp. and plug-compatible systems.

They provide up to 3M-bit/sec. disk transfer rates and 1M-bit/sec. tape transfer rates on a single board concurrently. Other features include 7-sector buffers and read-ahead attributes.

The S320-Plus combines both disk and tape functions and supports up to four SMD disk drives.

The S320-Plus is priced at $4,200, while the S310-Plus controller is priced at $3,400.

Cipher Data Products, P.O. Box 85170, 10101 Old Grove Road, San Diego, Calif. 92138.



Real Time Enterprises, Inc. has announced the **RTE Optical Disk File Management System**.

The system is said to provide online optical disk storage and retrieval capability for Apollo Computer, Inc. Domain computers. It combines an Optimem 1000 optical drive, a host adapter board, the RTE Optical Disk File Manager software and a set of utilities into a 1G-byte storage system accessible from Apollo nodes equipped with a Multibus.

The system costs $17,300.

Real Time Enterprises, Building E, 3000 Winton Road S., Rochester, N.Y. 14623.

■

Ciprico Inc. has introduced the **Rimfire 3400** enhanced small device interface (ESDI) intelligent caching disk controller for VME-based systems.

The controller is said to optimize system performance through intelligent control. It is capable of burst transfer rates from controller to bus of 20M bit/sec. and sustained transfer rates of 6M bit/sec. It also features a 512K-byte configurable cache memory and on-board firmware. It can support four ESDI disk drives.

The Rimfire 3400 is priced at $1,995.

Ciprico, 2955 Xenium Lane, Plymouth, Minn. 55441.

Printers/Plotters

Interface Systems, Inc. has announced an **IBM System 34, 36 and 38 plug-compatible version** of its Laser 8 desktop page printer.

The printer is said to enable users to produce eight page/min. of letter-quality output by selecting from dual input bins. It emulates the IBM 5219 daisywheel printer and supports IBM's Displaywrite. It prints on bond paper or transparency sheets in 80 or 132 columns. Resolution is 300 by 300 dot/in.

Other features include four type fonts and a two-line, 32 character LCD read-out that displays the printer's operating status.

The Laser 8 is priced at $4,950.

Interface Systems, 5855 Interface Drive, Ann Arbor, Mich. 48103.

PRICE REDUCTIONS

EMC Corp. has reduced the prices of its **memory upgrades** for Wang Laboratories, Inc. VS systems.

The reduction applies to EMC's 0.5M-, 1M-, 2M- and 4M-byte upgrades for the Wang VS 85, VS 90 and VS 100 computers.

One megabyte of EMC VS-compatible memory is priced at $4,500.

The price of EMC's Cache Bonus for the VS 90, consisting of 32K bits of cache memory and a 2M-byte main memory upgrade, has also been reduced to $15,000.

EMC, 12 Mercer Road, Natick, Mass. 01760.

■

Epson America, Inc. has announced a price reduction for its **EX-1000** nine-pin dot matrix printer.

The wide-carriage printer offers a draft speed of 300 char./sec. and an eight-button font selection panel.

It is now priced at $899.

Epson America, 2780 Lomita Blvd., Torrance, Calif. 90505.

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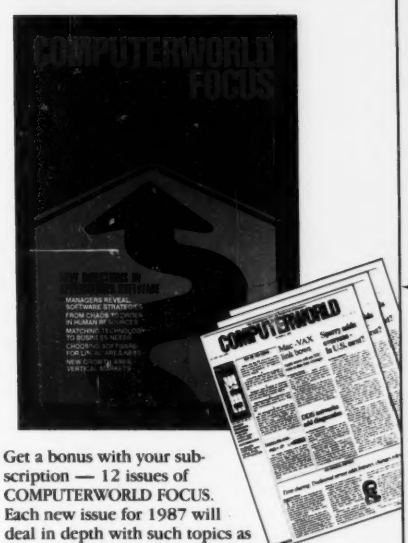

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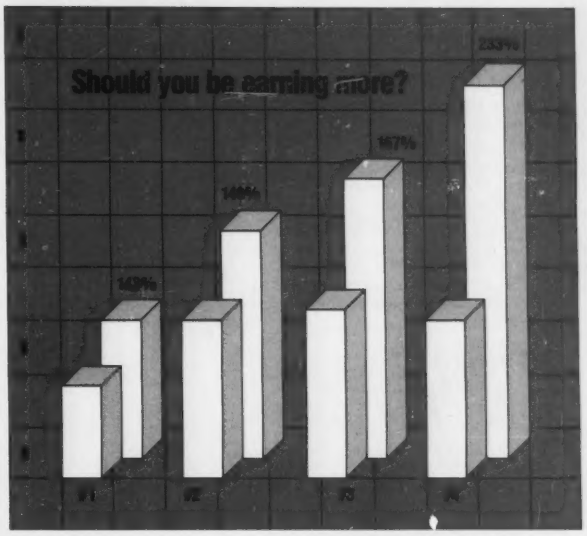

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